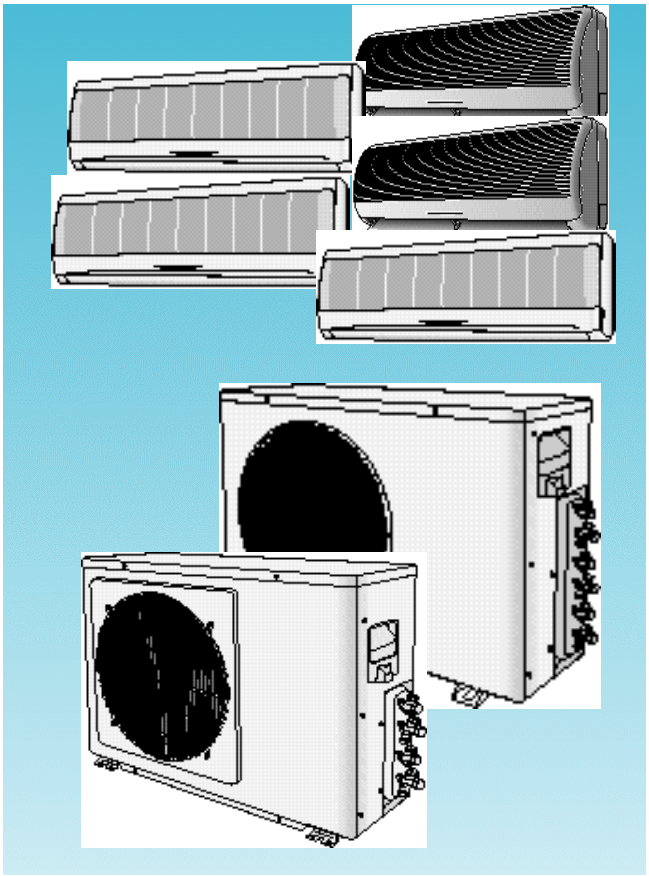
ROOM AIR CONDITIONER

INDOOR UNIT	OUTDOOR UNIT
AM14A1(B1)E07	UM14A1(B1)E2
AM20A1(B1)E06	UM20A1(B1)E3
AM20A1(B1)E08	

SERVICE Manual

AIR CONDITIONER



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3. Operating Instructions and Installation
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1. Precautions

1. Warning: Prior to repair, disconnect the power cord from the circuit breaker.

2. Use proper parts: Use only exact replacement parts. (Also, we recommend replacing parts rather than repairing them.)

3. Use the proper tools: Use the proper tools and test equipment, and know how to use them. Using defective tools or test equipment may cause problems later-intermittent contact, for example.

4. Power Cord: Prior to repair, check the power cord and replace it if necessary.

5. Avoid using an extension cord, and avoid tapping into a power cord. This practice may result in malfunction or fire.

6. After completing repairs and reassembly, check the insulation resistance. Procedure: Prior to applying power, measure the resistance between the power cord and the ground terminal. The resistance must be greater than 30 megohms.

7. Make sure that the grounds are adequate.

8. Make sure that the installation conditions are satisfactory. Relocate the unit if necessary.

9. Keep children away from the unit while it is being repaired.

10. Be sure to clean the unit and its surrounding area.

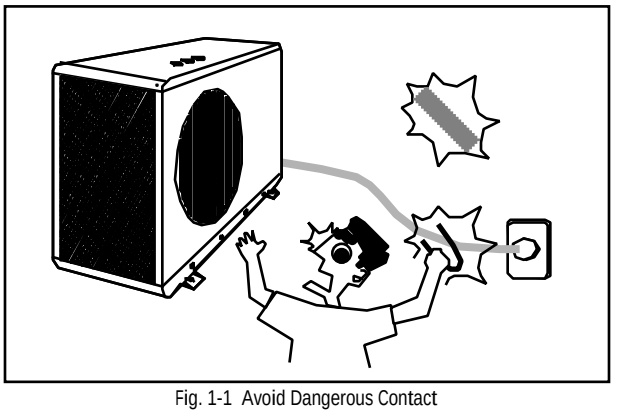


Fig. 1-1 Avoid Dangerous Contact

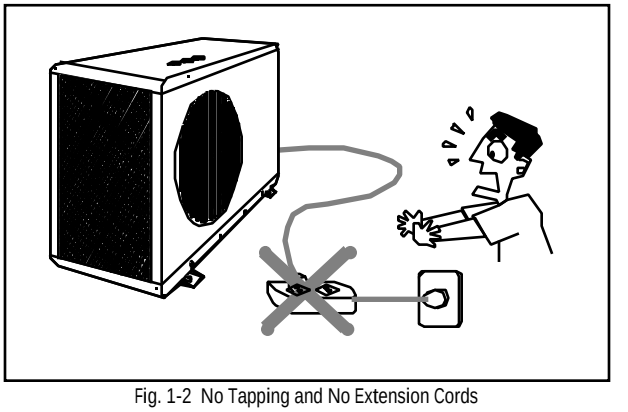


Fig. 1-2 No Tapping and No Extension Cords

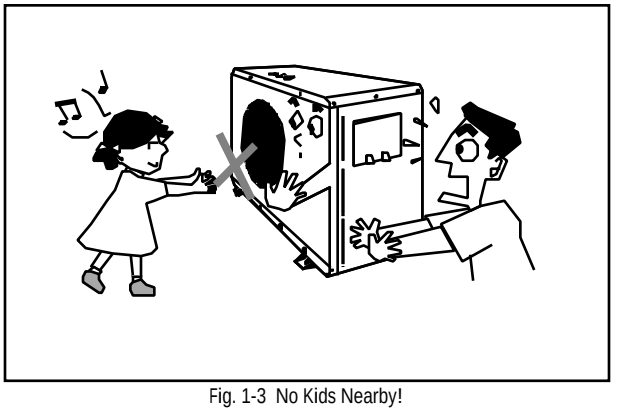


Fig. 1-3 No Kids Nearby!

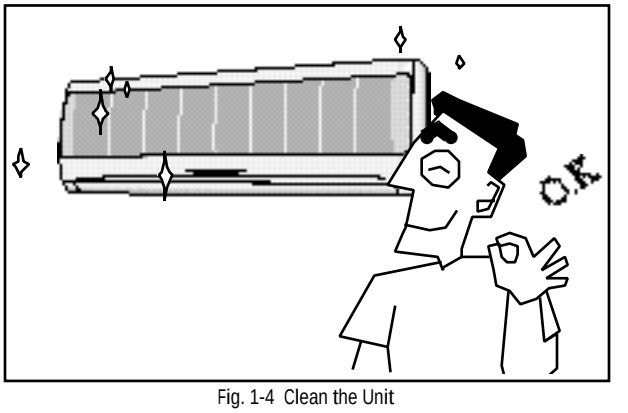
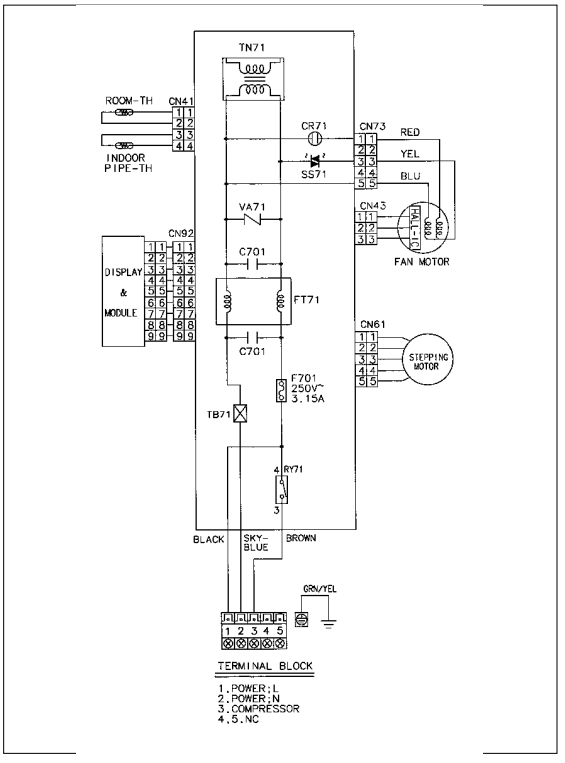


Fig. 1-4 Clean the Unit

9. Wiring Diagrams

9-1 Indoor Unit

• AM20A1(B1)E08



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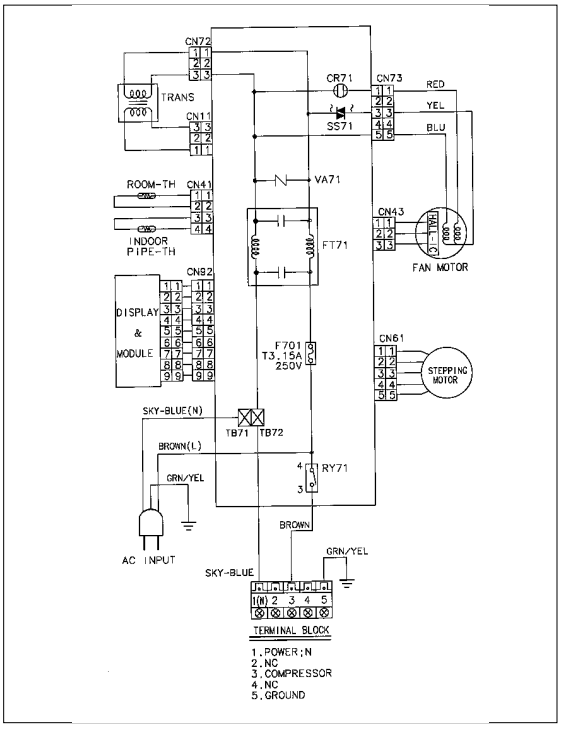

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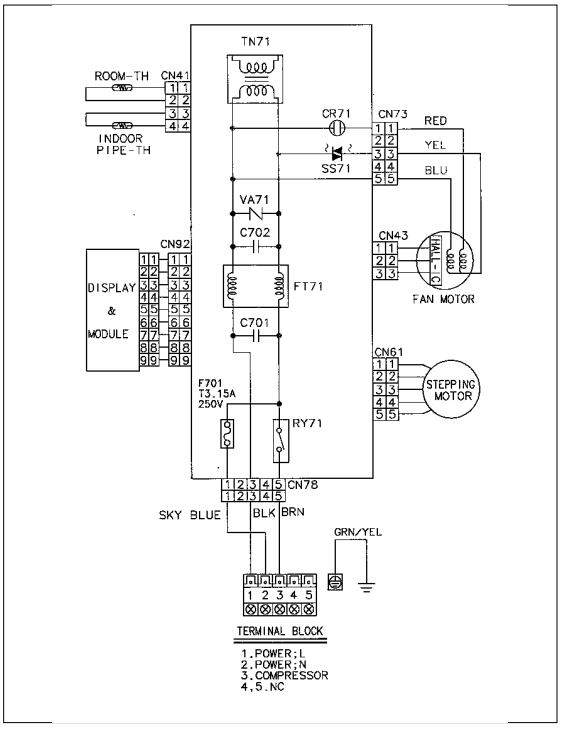
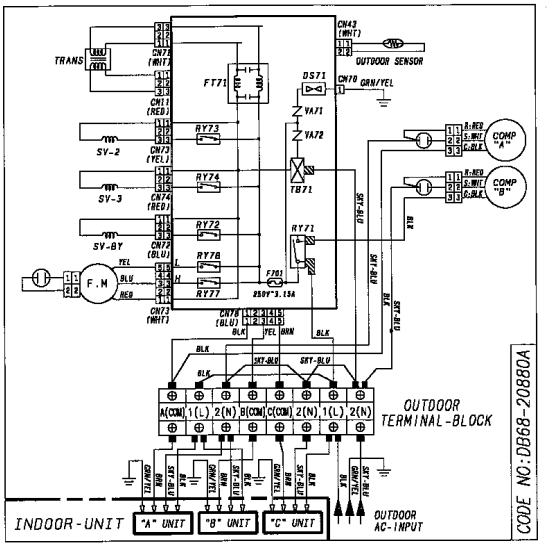
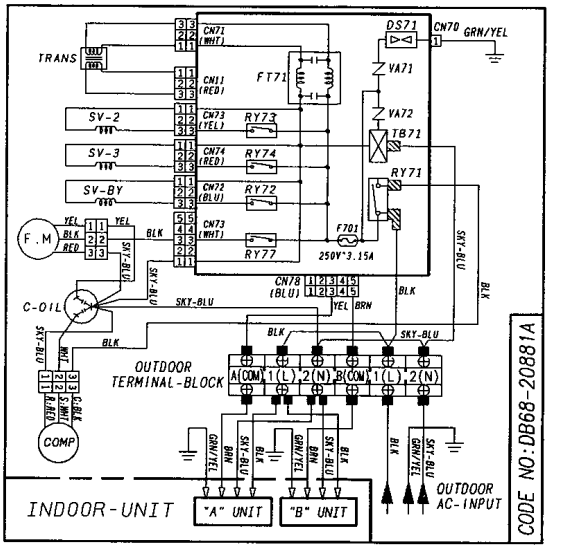


• UM20A1(B1)E3



• UM14A1(B1)E2



UPDA TE LOG SHEET

Application date	Page	Part#	Note(Cause & Solution)	S/Bulletin#

Use this page to keep any special servicing information. (Service Bulletin, etc.)
If only parts number changes, Just change parts number directly on parts list.
And if you need more information, please see the service bulletin

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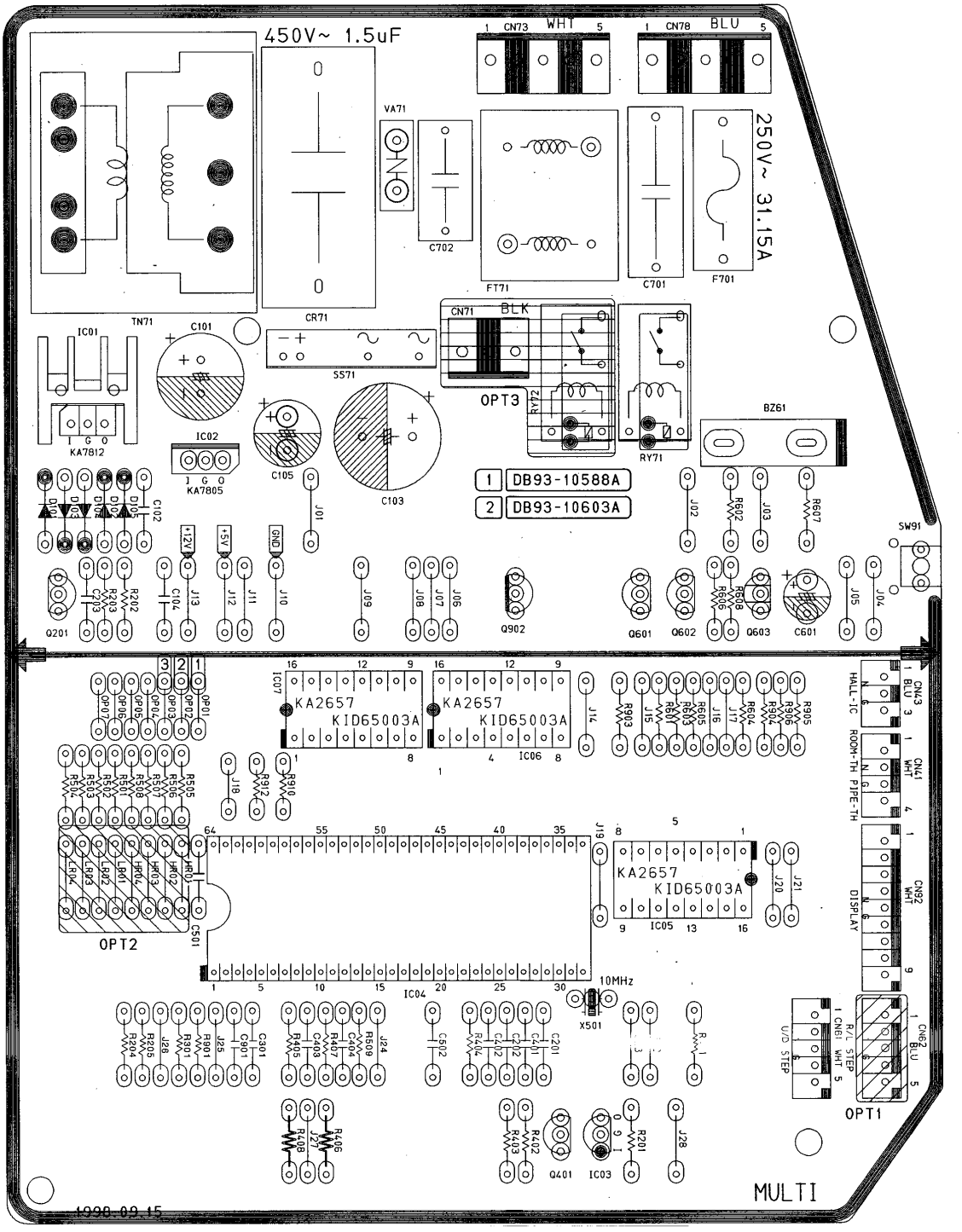
8. PCB Diagrams

8-1 Main PCB-INDOOR UNIT

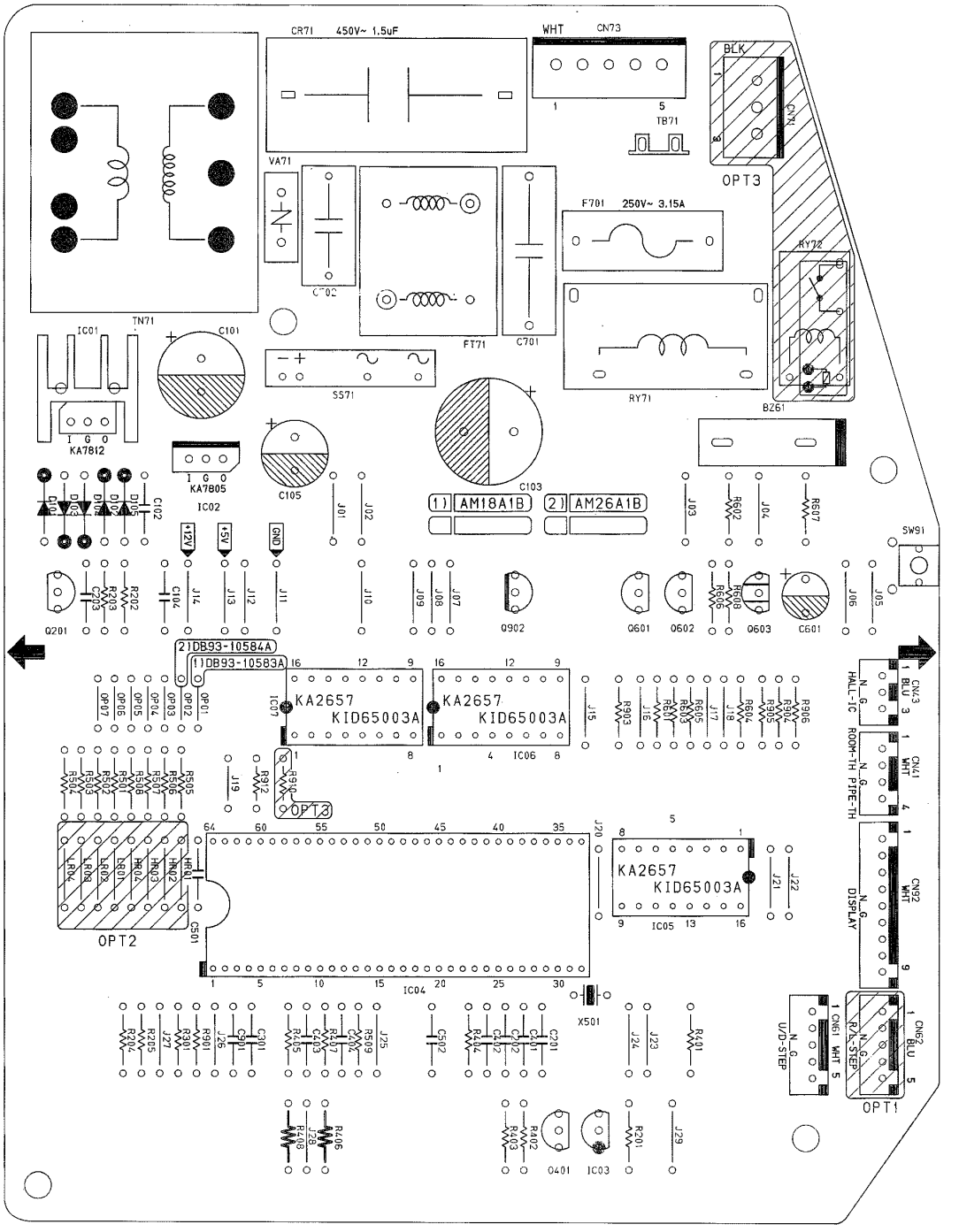
8-1-1 AM14A1(B1)E07 (DB93-10603A)



■ PART LIST

DESIGN LOCATION	CODE NO	Description	Specification	Q'TY
F701	DE32-10037A	FUSE	FST 250V 3.15A	1
F701	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A	1
IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1
IC01	DE62-30032A	HEAT-SINK	AL H25	1
IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY	1
IC02	DE13-10016A	IC-VOLT REGU	KA7805A	1
CR71	2306-000294	C-FILM	CQS 450V 1.5	1
FT71	DE29-90004A	FILTER NOISE	MD250V 1.6A 6mH	1
R903,904,905,906	2001-000776	R-CARBON	RD 1/2 T(S) 821-J	4
R203	2001-000588	R-CARBON	RD 1/4 TP 332-J	1
R202,301,409,501~509,513,518~521,601,604,606,902	2001-000065	R-CARBON	RD 1/4 TP 103-J	21
R522	2001-000065	R-CARBON	RD 1/4 TP 103-J	1
R523	2001-000065	R-CARBON	RD 1/4 TP 103-J	1
R405,407	2001-000036	R-CARBON	RD 1/4 TP 331-J	2
R201,204,405,401,402,404,603,606	2001-000042	R-CARBON	RD 1/4 TP 102-J	8
R607	2001-000855	R-CARBON	RD 1/4 TP 560-J	1
R602	2001-001088	R-CARBON	RD 1/2 TP 102-J	1
R403	2001-000890	R-CARBON	RD 1/4 TP 682-J	1
R910,912,913	A1000-0224	R-CARBON	RD 1/8 TP 332-J	3
R406,408	2004-001137	R-METAL FILM	RD 1/4 TP 682-F	2
D101~105	0402-000137	DIODE-RECT	1N4007	5
SS71	B4190-0016	THYRISTOR	G3MB-202PL	1
BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK	1
TN71	DE26-20154A	TRANS L.V	230V DC17V 300mA	1
TN71	DE60-60012A	PIN EYELET	OD2.5 L3.0	5
C202,402	2202-000783	C-CERAMIC	CA OA 50V 103Z	2
C301,401	2202-000796	C-CERAMIC	CA OA 50V 102Z	2
C102,104,201,203,403,404,501,502,902	2202-000780	C-CERAMIC	CA OA 50V 104Z	9
C103	2401-000710	C-ELEC	CE04 25V 222-M	1
C105	2401-001397	C-ELEC	CE 04 25V 471-M	1
C101	2401-000180	C-ELEC	CE 04 35V 102-M	1
C601	2401-001573	C-ELEC	47/50V	1
IC04	DE09-10149A	IC-MCU	MB89635R-466	1
IC03	DE13-20009A	IC	KA7533Z	1
X501	2802-000103	RSONATOR-CERAMIC	10MHz	1
IC05,IC06,IC07	DE13-20024A	IC-DRIVE	KID65003AP	3
Q201,401,601,602	A4050-0168	TR-GENERAL	KSC945Y	4
Q603	0501-000292	TRANSISTOR	A708Y	1
Q902, Q901	0504-000144	TRANSISTOR	R2002	2
SW91	3404-001013	SWITCH-TACT	KPT-1115V	1
CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT	1
CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU	1
CN41	3711-002662	CONNECTOR WAFER	JSW250-02WHT	1
CN61	3711-000999	CONNECTOR WAFER	SMW250-05 WHT	1
CN62	3711-000997	CONNECTOR WAFER	SMW250-05BLU	1
CN71		CONNECTOR WAFER	YW396-03AV BLK	1
CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT	1
TB71,72	DE59-30001A	CONNECTOR-TERMINAL	250TAP,1PIN	2
RY71	3501-001058	RELAY	DI1U DB12V	1
RY72,RY72	B3068-0092	RELAY	JQ1a-12V	2
J1~J35	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	35
HR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
HR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
HR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
HR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1
LR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1
LR02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1
LR03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
LR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
SW02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1
SW01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
OP01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
OP02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1
OP03	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0
OP04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0

8-1-2 AM20A1(B1) E08(DB93-00072A)



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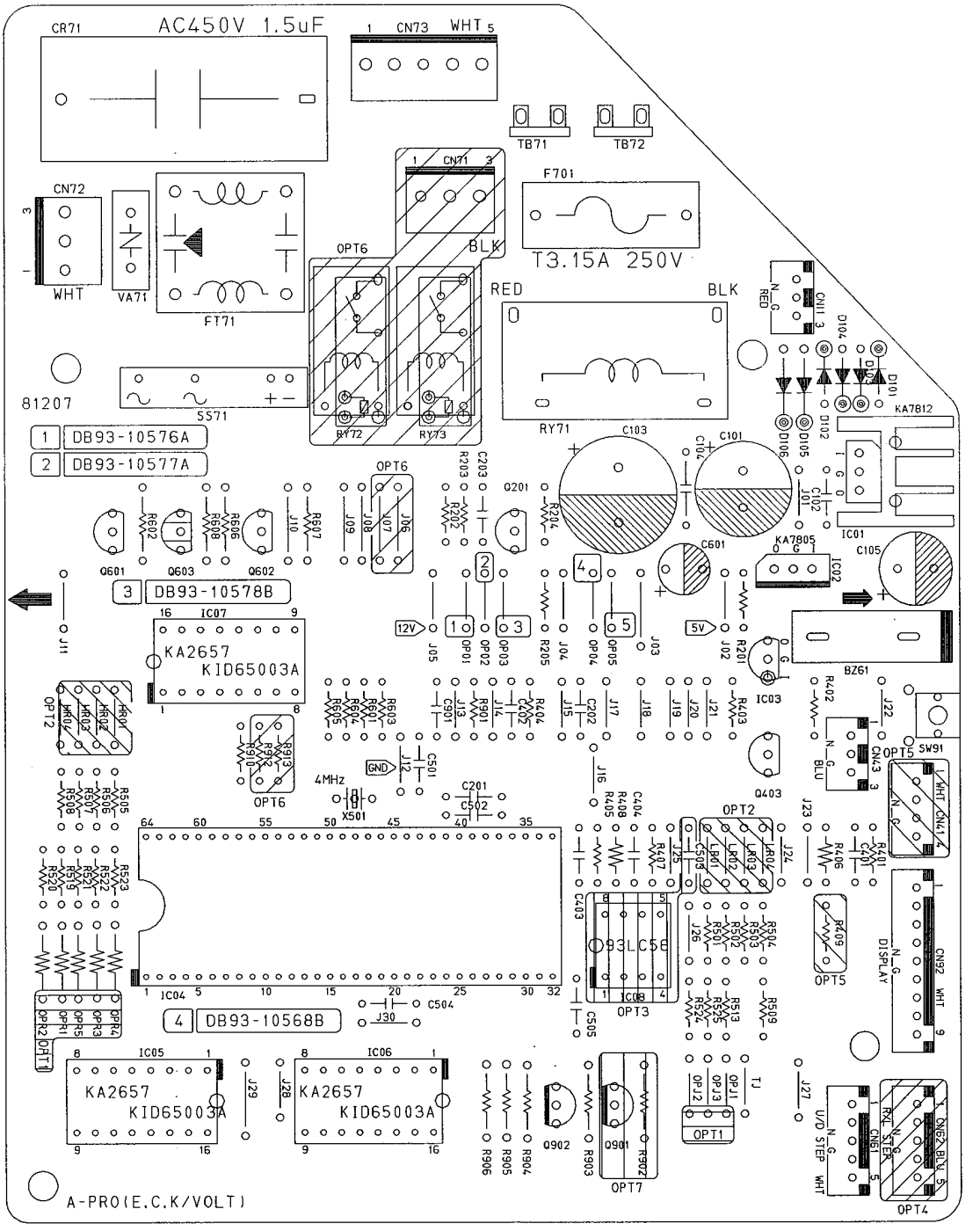
2	F701	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A	1
3	IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1
4	IC01	DE62-30032A	HEAT-SINK	AL H25	1
5	IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY	1
6	IC02	DE13-10016A	IC-VOLT REGU	KA7805A	1
7	CR71	2306-000294	C-FILM	CQS 450V 1.5	1
8	FT71		FILTER NOISE	LSA05230P	1
9	R903	2001-000776	R-CARBON	RD 1/2 T(S) 471-J	1
10	R203	2001-000588	R-CARBON	RD 1/4 TP 332-J	1
11	R202,301,409,501~509,513,601,604,606,901	2001-000065	R-CARBON	RD 1/4 TP 103-J	17
12	R405,407	2001-000036	R-CARBON	RD 1/4 TP 331-J	2
13	R201,204,401,402,404,603,605	2001-000042	R-CARBON	RD 1/4 TP 102-J	7
14	R607	2001-000855	R-CARBON	RD 1/4 TP 560-J	1
15	R602	2001-001088	R-CARBON	RD 1/2 T(S) 102-J	1
16	R403	2001-000890	R-CARBON	RD 1/4 TP 682-J	1
17	R910,912	A1000-0244	R-CARBON	RD 1/8 TP 332-J	2
18	R406,408	2004-001137	R-METAL FILM	RD 1/4 TP 682-F	2
19	D101~105	0402-000137	DIODE-RECT	1N4007	5
20	SS71	B4190-0016	THYRISTOR	G3MB-202PL	1
21	BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK	1
22	TN71	DE26-20154A	TRANS L.V	230V DC17V 300mA	1
23	TN71	DE60-60012A	PIN EYELET	OD2.5 L3.0	5
24	C202,402	2202-000783	C-CERAMIC	CA OA 50V 103Z	2
25	C301,401	2202-000796	C-CERAMIC	CA OA 50V 102Z	2
26	C102,104,201,203,403,404,501,502,901	2202-000780	C-CERAMIC	CA OA 50V 104Z	9
27	C103	2401-000710	C-ELEC	CE04 25V 222-M	1
28	C105	2401-001397	C-ELEC	CE 04 25V 471-M	1
29	C101	2401-000180	C-ELEC	CE 04 35V 102-M	1
30	C601	2401-001573	C-ELEC	47UF/50V	1
31	IC04	DE09-10149A	IC-MCU	MB89635R-466	1
32	IC03	DE13-20009A	IC	KA7533Z	1
33	X501	2802-000103	RSONATOR-CERAMIC	10MHz	1
34	IC05,IC06,IC07	DE13-20024A	IC-DRIVE	KID65003AP(KA2657)	3
35	Q201,401,601,602	A4050-0168	TR-GENERAL	KSC945Y	4
36	Q603	0501-000292	TRANSISTOR	A708Y	1
37	Q902, Q901	0504-000144	TRANSISTOR	R2002	2
38	SW91	3404-001013	SWITCH-TACT	KPT-1115V	1
39	CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT	1
40	CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU	1
41	CN41	3711-000940	CONNECTOR WAFER	SMW250-04(WHT)	1
42	CN61	3711-000999	CONNECTOR WAFER	SMW250-05 WHT	1
43	CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT	1
44	TB71	DE59-30001A	CONNECTOR-TERMINAL	250TAP,1PIN	1
45	RY71	3501-001058	RELAY	DI1U DC12V	1
46	J1~J29,HR01,03,LR01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	32
47	C701		C-MYLAR	224K	1
48	C702		C-MYLAR	104K	1
49	R904~906		R-CARBON	RD 1/2T(S) 621-J	3
50	CM71		CONNECTOR WAFER	YW396-03AV(BLK)	1
51	RY72	3501-000399	RELAY	JQ1a-12V	1

8-1-3 AM20A1(B1)E06 (DB93-10628A)



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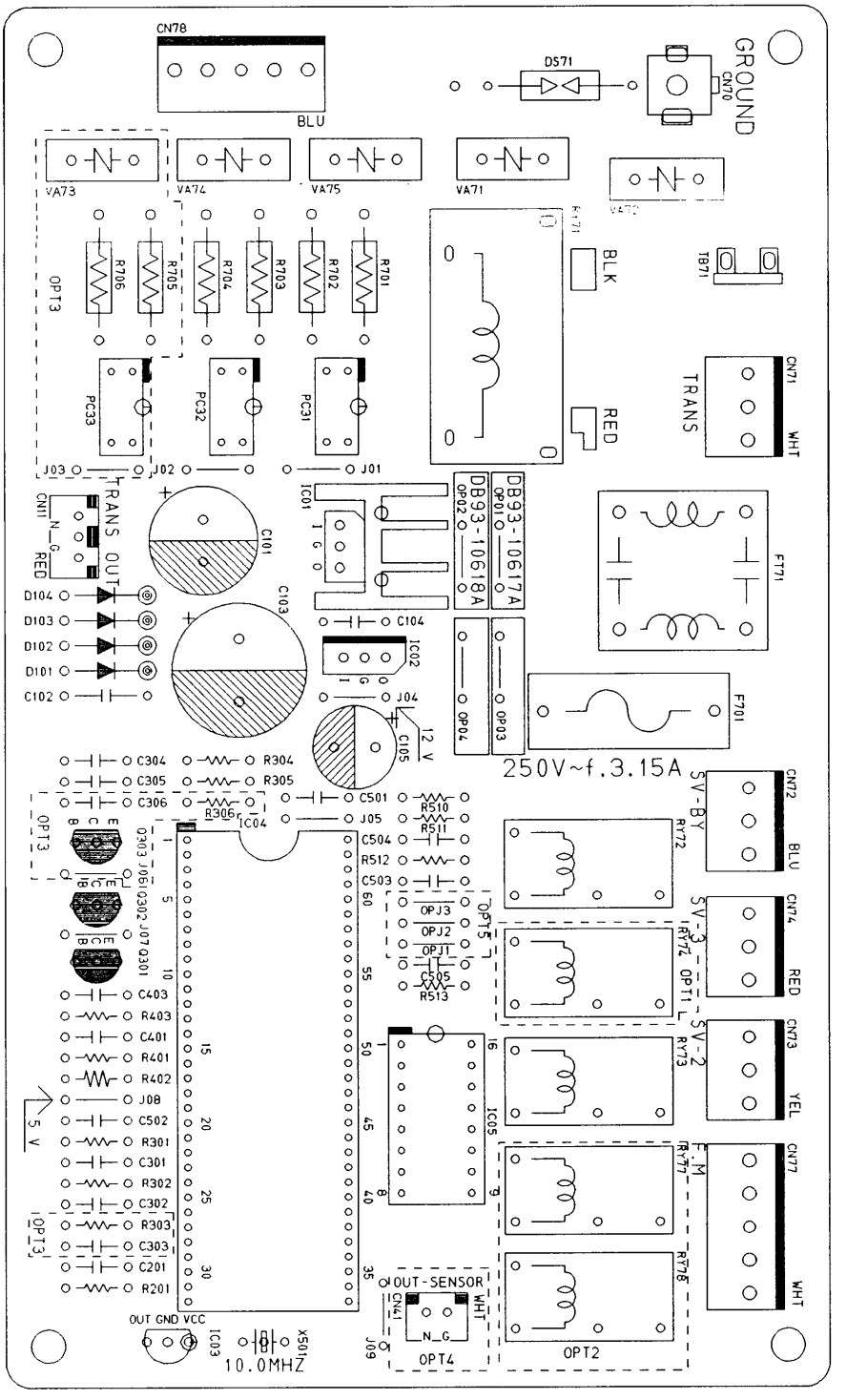
F701	DB47-40024A	HOLDER-FUSE	FH-51H 7.5A	1
IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1
IC01	DE62-30032A	HEAT-SINK	AL H25	1
IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY	1
IC02	DE13-20016A	IC-VOLT REGU	KA7805A	1
VA71	1405-000147	VARISTOR	470V 4500A	1
CR71	2301-001094	C-FILM	CQS 450V 1.5µF	1
FT71	DE29-90004A	FILTER NOISE	MD250V 1.6A 6mH	1
R904, 905, 906	2001-001172	R-CARBON	RD 1/2 T(S) 620-J	3
R203	2001-000588	R-CARBON	RD 1/4 TP 332-J	1
R202, 501~509, 513, 519~525, 601, 604		R-CARBON	RD 1/8 TP 103-J	21
R606	2201-000065	R-CARBON	RD1/4 TP 103-J	1
R405, 407		R-CARBON	RD 1/8 TP 331-J	2
R201, 204, 205, 401, 402, 404, 603, 605		R-CARBON	RD 1/8 TP 102-J	8
Q603	0501-000292	TR-SMALL SIGNAL	KSA708-Y	1
R607	2001-000855	R-CARBON	RD 1/4 TP 560-J	1
R608	2001-000042	R-CARBON	RD 1/4 TP 102-J	1
R602	2001-001088	R-CARBON	RD 1/2 TP 102-J	1
R403		R-CARBON	RD 1/8 TP 682-J	1
R910, 203		R-CARBON	RD 1/8 TP 332-J	2
R406, 408		R-METAL FILM	RM 1/8 TP 682-F	2
D101~104		DIODE-RECT	IT4	4
D105, 106	0401-000137	DIODE-RECT	1N4007	2
SS71	3502-000115	THYRISTOR	G3MB-202PL	1
BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK	1
TN71	DE26-20154A	TRANS L.V	230V DC17V 300mA	1
TN71	DE60-60012A	PIN EYELET	OD2.5 L3.0	5
C202, 402	2202-000127	C-CERAMIC	CA OA 50V 103Z	2
C301, 401	2202-000173	C-CERAMIC	CA OA 50V 102Z	2
C102, 104, 201, 203, 403, 404, 501, 502, 901, 504, 505	2202-000780	C-CERAMIC	CA OA 50V 104Z	11
C103	2401-000711	C-ELEC	CE04 25V 222-M	1
C105	2401-001778	C-ELEC	CE 04 25V 471-M	1
C101	2401-000180	C-ELEC	CE 04 35V 102-M	1
C601	2401-001573	C-ELEC	47µF/50V	1
IC04	DE09-10186A	IC-MCU	UPD780032CW	1
IC03	DE13-20009A	IC	KA7533Z	1
X501	2802-000161	RESONATOR-CERAMIC	4MHz	1
IC05, IC06, IC07	DE13-20024A	IC-DRIVE	KID65003AP	3
Q201, 403, 601, 602	0501-000398	TR-SMALL SIGNAL	KSC945-Y	4
R902, 903	2001-000776	R-CARBON	470-J, 1/2W	2
Q901, 902	0504-000144	TRANSISTOR	R2002	2
SW91	3404-001013	SWITCH-TECT	15V, 20mA	1
CN72	3711-000203	CONNECTOR HEADER	YW396-03AV WHT	1
CN11	3711-000880	CONNECTOR HEADER	SMW250-03 RED	1
CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT	1
CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU	1
CN41	3711-000940	CONNECTOR WAFER	SMW250-04WHT	1
CN61	3711-000999	CONNECTOR WAFER	SMW250-05 WHT	1
CN62	3711-000997	CONNECTOR WAFER	SMW250-05 BLU	-
CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT	1
TB71, 72	DE59-30001A	TERMINAL	250TAB, 1PIN	2
RY71	3501-001058	POWER RELAY	DI1U	1
OPR1	2004-000696	R-METAL	3.32K-F, V8W	1
OPR2	2004-000666	R-METAL	28.7K-F, 1/8W	1
OPR4	2004-000284	R-METAL	12K-F, 1/8W	1
OPR5	-	R-METAL	18K-F, 1/8W	1
	DE39	WIRE SO COPPER		34

8-2 PCB OUTDOOR UNIT

8-2-1 • UM14A1(B1)E2(DB93-10618A)
• UM20A1(B1)E3(DB93-10617A)



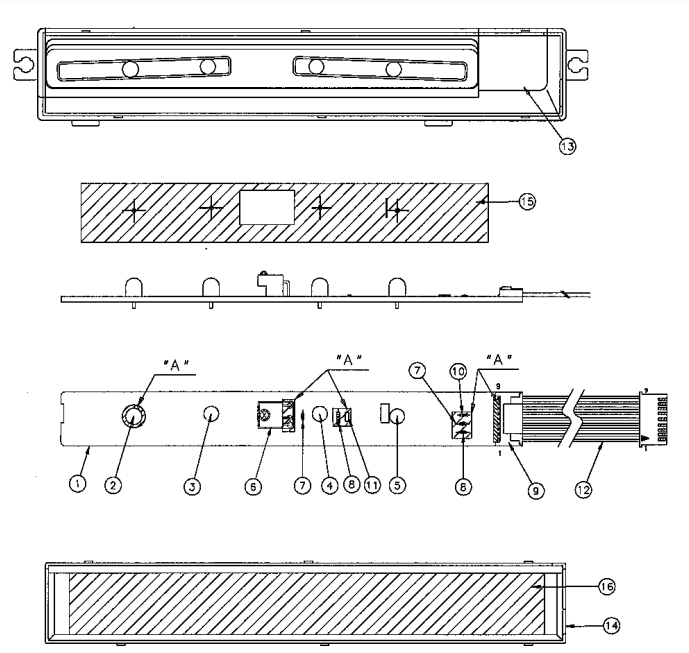
■ PART LIST

No.	CODE NO	Description	Specification	Q'TY		Remark
				UM14A1(B1)E2	UM27A1(B1)E3	
-						
J01-J09	DE39-60001A	JUMP-WIRE	PI 0.6 SN T 52MM	9	9	
OP01	DE39-60001A	JUMP-WIRE	PI 0.6 SN T 52MM	1	1	
C304~306	2202-000783	C-CERAMIC	50V 103Z	3	3	
C501~505, C201, C301~303,	2202-000780	C-CERAMIC	50V 104Z	13	13	
C401, C404, C102, C403		C-CERAMIC	50V 104Z	4	4	
D101~D104	0402-000137	DIODE-RECT	1N4007	11	11	
R510~513, 403	2001-000290	R-CARBON	RD 1/8 T 10K-J			
R304-306, R403		R-CARBON	RD 1/8 T 10K-J			
R301~R303		R-CARBON	RD 1/8 T 10K-J			
R201	2001-000429	R-CARBON	RD 1/8 T 1K-J	1	1	
R401	2001-000003	R-CARBON	RD 1/8 T 330-J	1	1	
R402	2004-001137	R-CARBON	RD 1/8 T 6.8K-F	1	1	
R701~R704,R701~R706	2003-002036	R-CARBON	RS 2 T 51K-J	4	6	
PCB BOARD		PCB-MAIN	FR-1 197*330	1	1	
Q301~303	0504-000144	TR	KSR1002	3	3	
IC03	DE13-20009A	RESET IC	KA7533Z	1	1	
IC05	DE13-20024A	IC-DRIVE	KID650003AP	1	1	
CN11	3711-000879	CON-HEAD	SMW250-03 RED	1	1	
CN41	3711-002662	CON-HEAD	SMW250-02 WHT	-	1	
CN71	3711-000203	CONNECTOR-WAFE	YW396-03AV WHT	1	1	
CN72	3711-003404	CONNECTOR-WAFE	YW396-03AV BLU	1	1	
CN73	3711-003406	CONNECTOR-WAFE	YW396-03AV YEL	1	1	
CN74	3711-003407	CONNECTOR-WAFE	YW396-03AV RED	1	1	
CN77	3711-000262	CONNECTOR-WAFE	YW396-05AV WHT	1	1	
CN78	3711-000260	CONNECTOR-WAFE	YW396-05AV BLU	1	1	
PC31~PC33	DB47-90079A	PHOTO-COUPLER	PC814A	2	3	
X501	2802-000103	CERAMIC-RESONATOR	10.0MHZ	1	1	
C105	2401-001397	C-ELEC	25V 470ßfi	1	1	
C103	2401-000710	C-ELEC	25V 2200ßfi	1	1	
C101	2401-000180	C-ELEC	35V 1000ßfi	1	1	
VA71~75	1405-000147	VARISTOR	14D 471	4	5	
DS71	DB47-90059A	DISCHARGE	DSA362MA	1	1	
FT71	DE29-90004A	NOISE-FILTER	HP1-P16	1	1	
CN70		PIN-HOUSING	YDW236-01	1	1	
RY71	3501-001058	POWER-RELAY	DI1U(12V)	1	1	
IC04	DB09-10152A	IC-MCU	MB89635PSH-XXXX	1	1	
RY72~74, 77, 78	3501-000	RELAY	JQ1A-12V	5	5	
IC01	DE62-300	HEAT-SINK	25MM	1	1	
"	DE60-10100A	SCREW-TAPPING	PH 3 L6 AB FEFZY	1	1	
"	DE13-20008A	IV-VOLT REGU	KA7812	1	1	
IC02	DE13-20016A	IC-VOLT REGU	KA7805	1	1	
F701	DE32-10037A	FUSE	AC250V 3.15A 20MM	1	1	
"	DB47-40024A	FUSE-HOLDER	FH51H 7.5A	1	1	
TB71	DE59-30001A	TERMINAL TAP	YTR-250	1	1	
OPJ2	DE39-60001A	JUMP-WIRE	PI0.6SM T52MM	1	-	

8-3 ASS'Y DISPLAY & Module

8-3-1 AM14A1E07 / AM20A1E08

• DB93-10560B

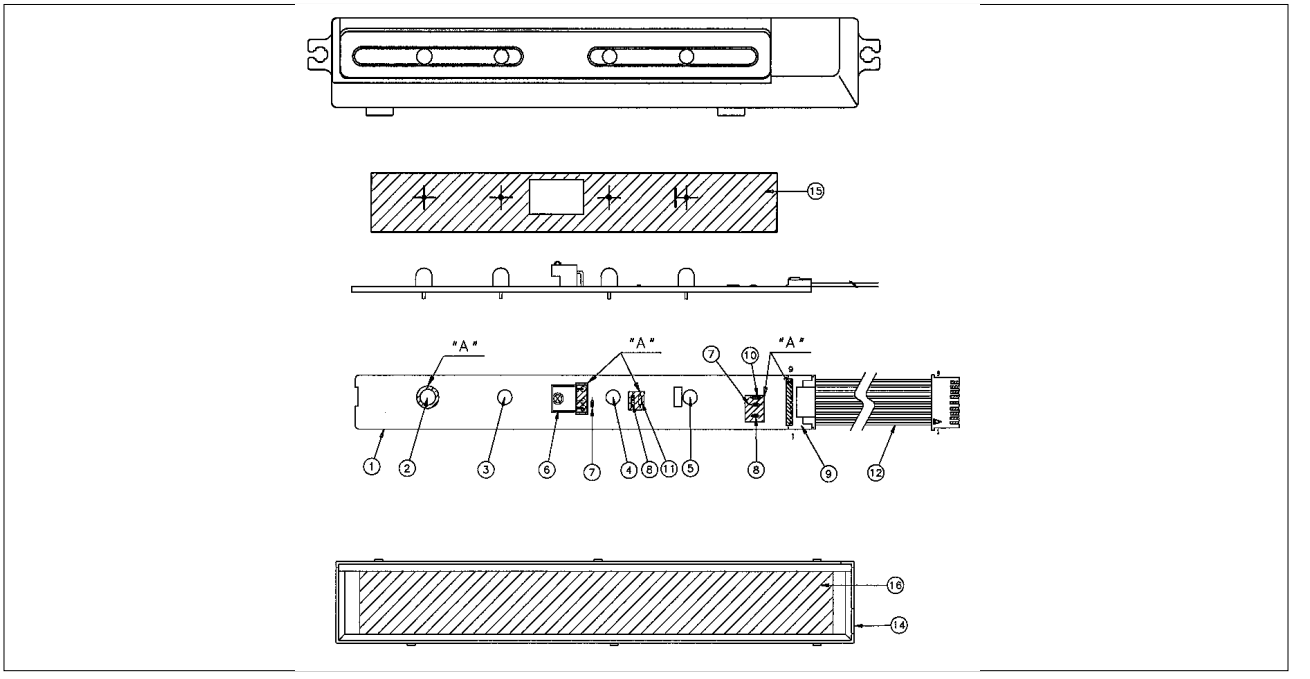


■ PART LIST

No	Description	CODE-NO	Specification	Q'TY
1	PCB-DISPLAY	DB41-10204B	FR-1 T1.6 W20 L170	1
2	LED - LAMP	0601-001333	LTL-30EHJ(ORG/GRN)	1
3	LED - LAMP	0601-001059	SY5511(YEL)	1
4	LED - LAMP	0601-001060	SM5511(GRN)	1
5	LED - LAMP	0601-001196	SO5511(ORG)	1
6	MODULE REMOCON	DB32-50027A	PNA4612MOOXD	1
7	C-CERAMIC	2202-000780	CA 0A 50V 104Z	2
8	R-CARBON	2001-000515	RD 1/8TP 221-J	2
9	CONNECTOR WAFER		YWL A200-09P	1
10	C-CERAMIC	2001-000283	CA 0A 50V 102Z	1
11	DIOD SWITCHING	0401-000005	1N4148	1
12	C/W DIS & MODULE	DB39-20346A	UL1007 AWG#26/9	1
13	CASE-CENTER PCB UP	DB61-10191A	PC, BLUE	1
14	CASE-CENTERPCB LOW	DB63-10494A	ABS, BLK	1
15	SEAL DISPLAY UPP	DB72-10233A	FOAM-PE, BLK	1
16	SEAL CASE DISPLAY	DB72-10220F	30FOAM-PE	1

8-3-2 AM14B1E07 / AM20B1E08

• DB93-10561B

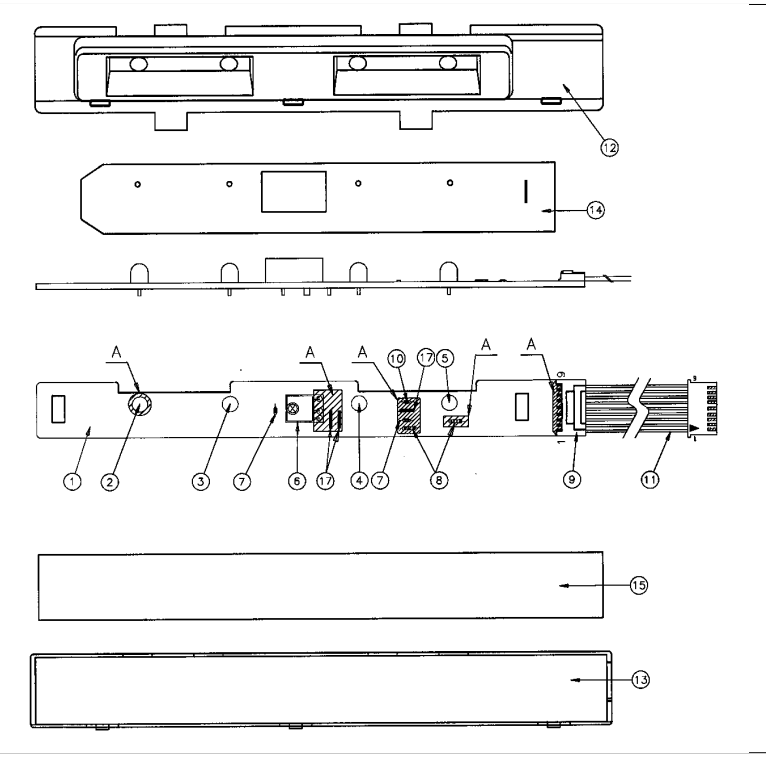


■ PART LIST

No	Description	CODE-NO	Specification	Q'TY
1	PCB-DISPLAY	DB41-10205B	FR-1 T1.6 W20 L170	1
2	LED - LAMP	0601-001333	LTL-30EHJ(ORG/GRN)	1
3	LED - LAMP	0601-001059	SY5511(YEL)	1
4	LED - LAMP	0601-001060	SM5511(GRN)	1
5	LED - LAMP	0601-001196	SO5511(ORG)	1
6	MODULE REMOCON	DB32-50027A	PNA4612MOOXD	1
7	C-CERAMIC	2202-000780	CA 0A 50V 104Z	2
8	R-CARBON	2001-000515	RD 1/8TP 221-J	2
9	CONNECTOR WAFER		YWL A200-09P	1
10	C-CERAMIC	2201-000283	CA 0A 50V 102Z	1
11	DIOD SWITCHING	0401-000005	1N4148	1
12	C/W DIS & MODULE	DB39-20346A	UL1007 AWG#26/9	1
13	CASE-CENTER PCB UP	DB61-10197A	PC, BLUE	1
14	CASE-CENTER PCB LOW	DB63-10494A	ABS, BLK	1
15	SEAL DISPLAY UPP	DB72-10245A	FOAM-PE, BLK	1
16	SEAL CASE DISPLAY	DB72-10220F	30FOAM-PE	1

8-3-3 AM20A1(B1)E06

• DB93-10619B

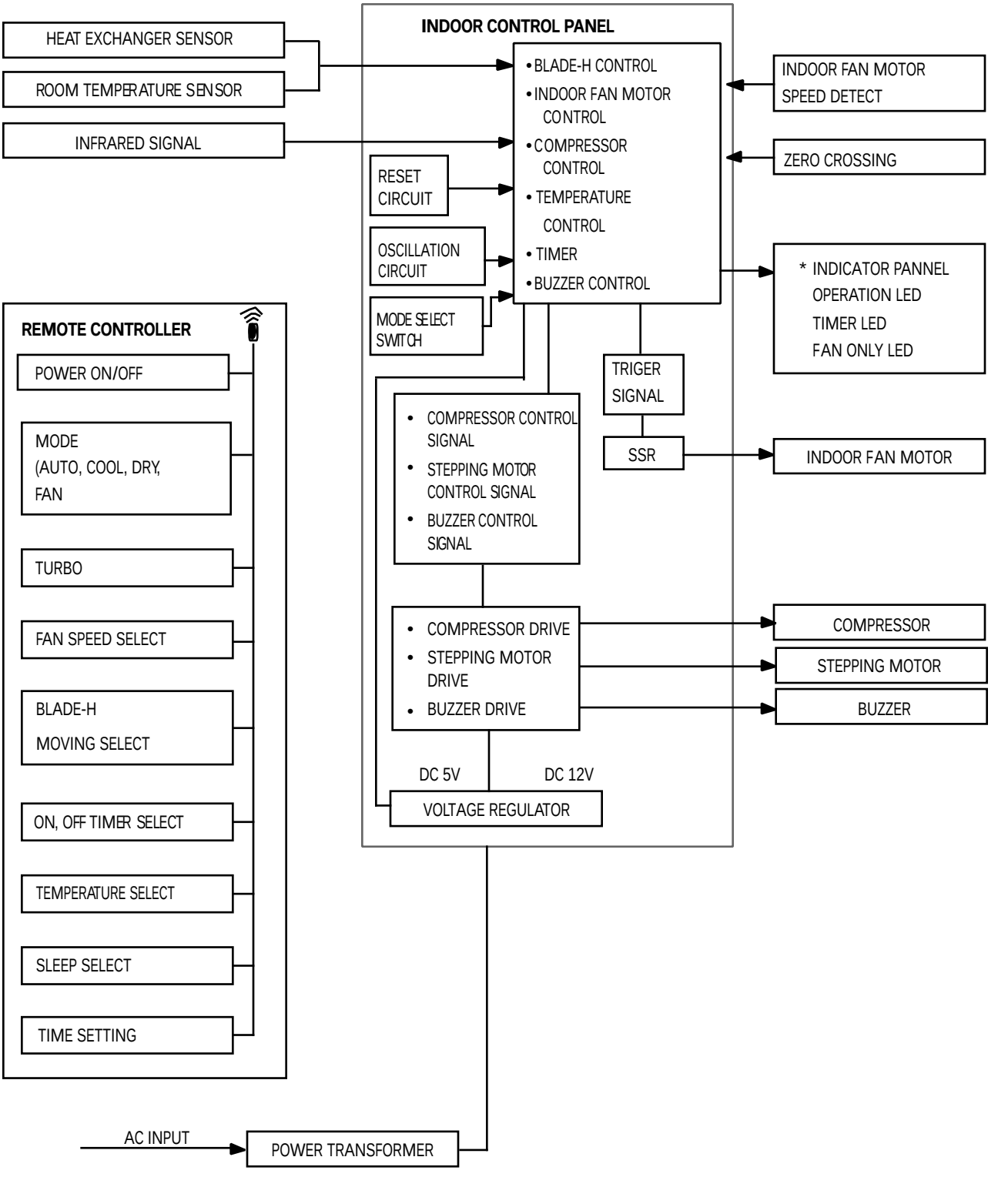


■ PART LIST

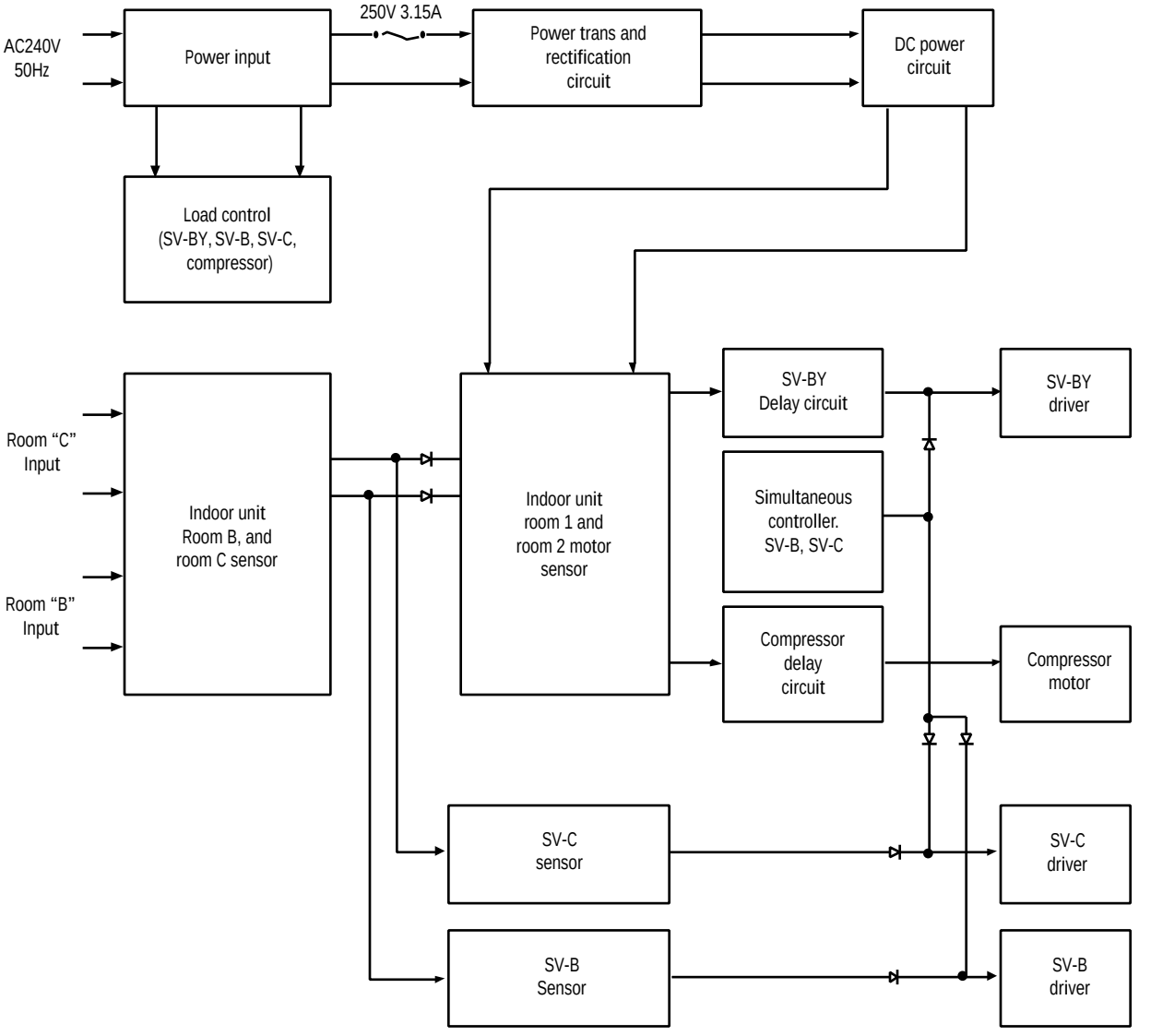
No	Description	CODE-NO	Specification	Q'TY
①	DB41-10202B	PCB-DISPLAY	FR-1 T1.6 W20 L167	1
②	0601-001333	LED - LAMP	LTL-30EHJ(ORG/GRN)	1
③	0601-001059	LED - LAMP	SY5511(YEL)	1
④	0601-001060	LED - LAMP	SM5511(GRN)	1
⑤	0601-001196	LED - LAMP	SO5511(ORG)	1
⑥	DB32-50027A	MODULE-REMOCON	PNA4612Møø X D	1
⑦	2202-000780	C-CERAMIC	CA OA 50V 104Z	2
⑧	2001-000034	R-CARBON	RD 1/4TP 221-J	2
⑨		CONNECTOR WAFER	YWLA200-09P	1
⑩	2201-000283	C-CERAMIC	CA OA 50V 102Z	1
⑪	DB39-20346A	C/W DIS & MODULE	UL1007 AWG#26/9	1
⑫	DB61-10196A	CASE-CENTER PCB	PC, BLUE	1
⑬	DB63-10500A	COVER DISPLAY	ABS, BLK	1
⑭	DB72-10246A	SEAL DISPLAY UPP	FOAM-PE, BLK	1
⑮	DB72-10250A	SEAL CASE DISPLAY	30FOAM-PE	1
PAINT		JUMP-WIRE	6mm	3

7. Block Diagrams

7-1 Micro Computer Block Diagram



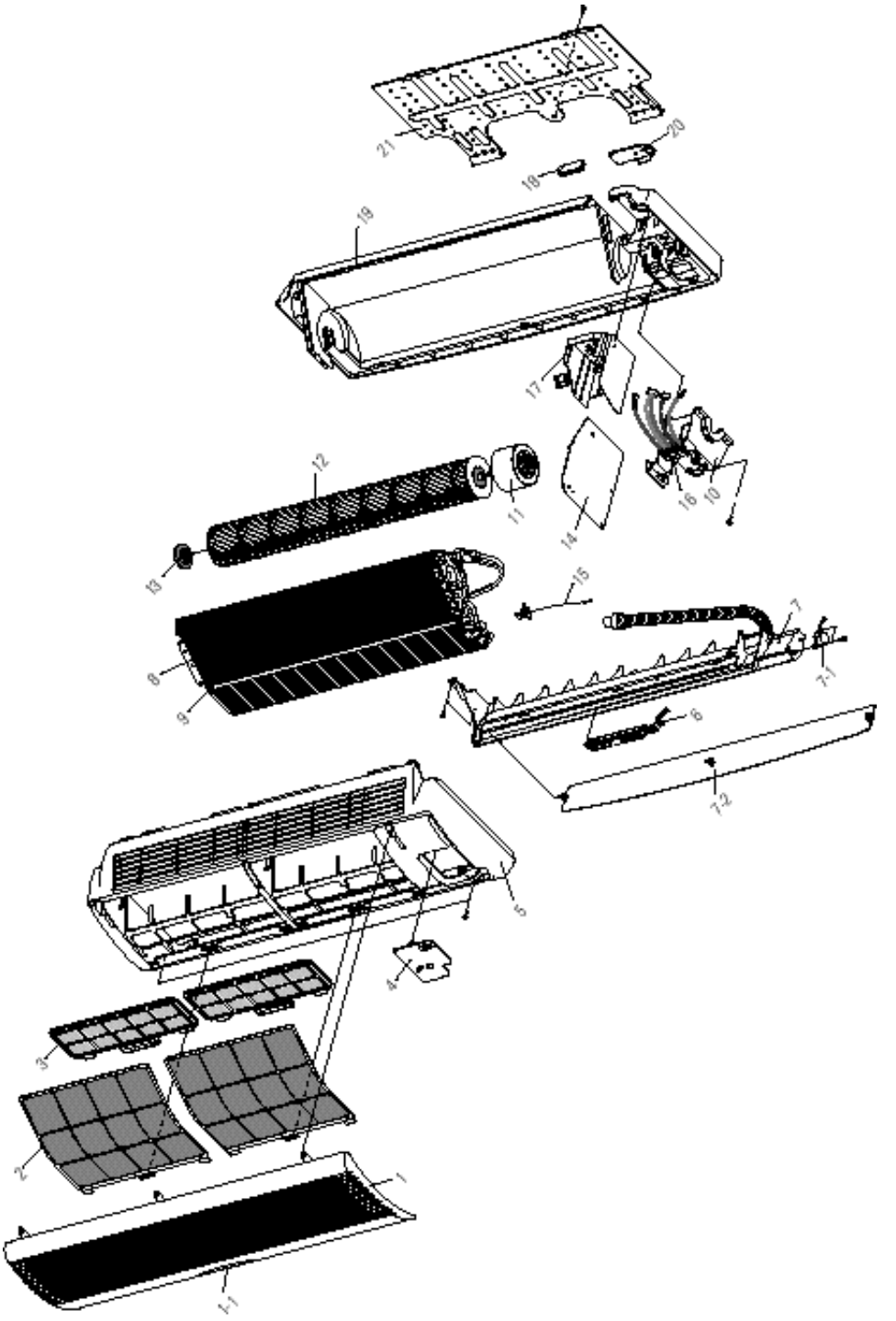
7-2 Outdoor Unit Control Diagram (IC-TYPE)



6. Exploded Views and Parts List

6-1 Indoor Unit

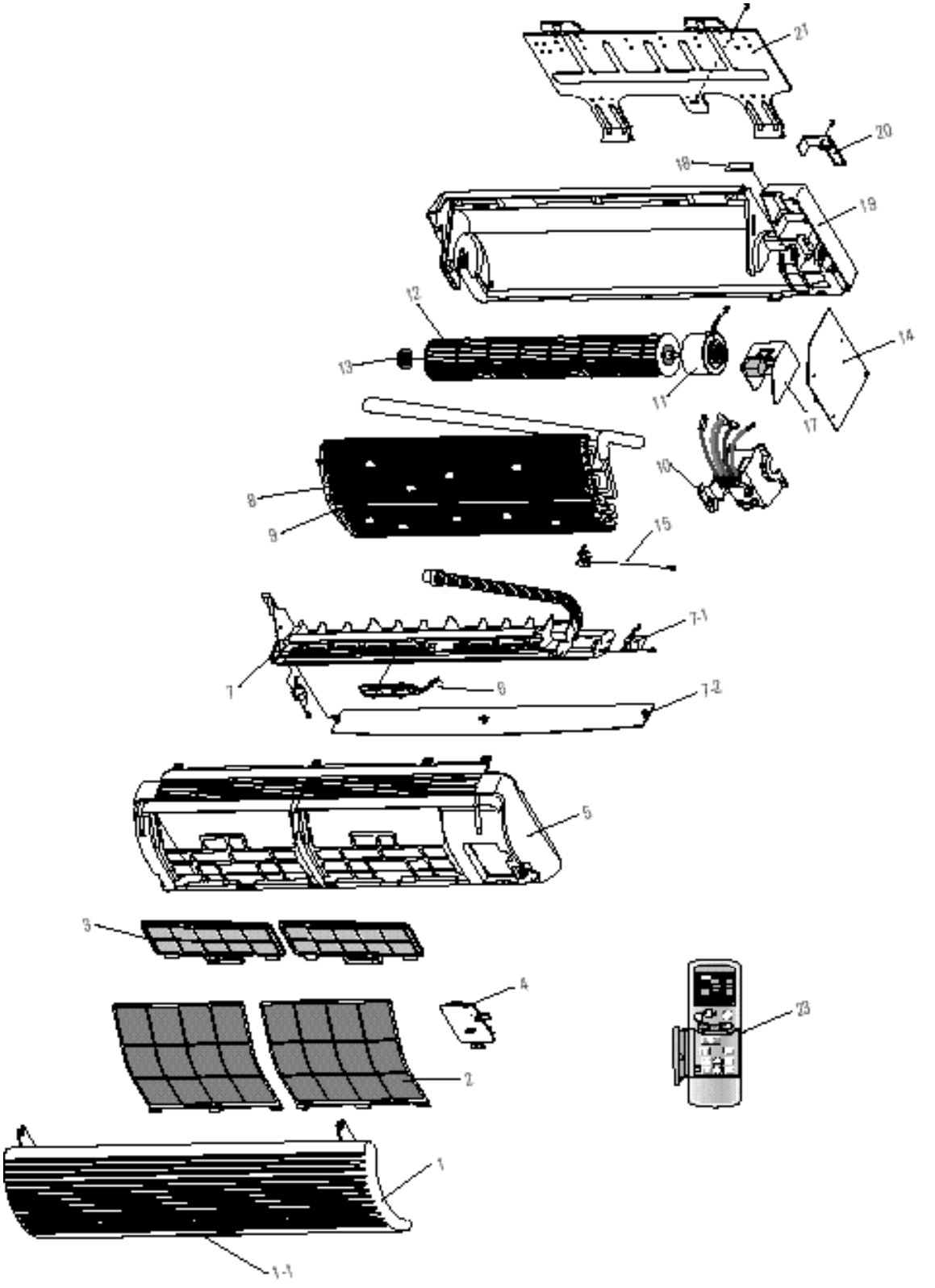
6-1(a) AM20A1(B1)E08, AM14A1(B1)E07



■ Parts List

No.	CODE NO	Description	Specification	Q'TY		Remark
				AM14A1(B1)E07	AM20A1(B1)E08	
1	DB64-10140A	GRILLE AIR INLET	ABS	1	1	
1-1	DB64-70073A	PANEL CENTER DISPLAY	PC	1	1	
2	DB63-30131A	GUARD AIR FILTER	PP	2	2	
3	DB74-10091A	ASS´Y FILTER	CLEANER/CARBON	(1)	(1)	OPTION
4	DB63-10472B	COVER TERMINAL	HIPS	1	1	
5	DB92-70075E	ASS´Y FRONT PANEL	ASS´Y	1	1	
6	DB93-10560B	ASS´Y DISPLAY PCB	ASS´Y(A1-GRILLE)	1(A1)	1(A1)	⚠
	DB93-10561B	ASS´Y DISPLAY PCB	ASS´Y(B1-GRILLE)	1(B1)	1(B1)	⚠
7	DB94-10088A	ASS´Y TRAY DRAIN	ASS´Y	1	1	
7-1	DB95-20138A	ASS´Y STEP MOTOR U/D	DC12V.600GR	1	1	⚠
7-2	DB66-30153A	BLADE-H	HIPS	1	1	
8	DB75-40077B	ASS´Y EVAP	ASS´Y	1	1	
9	DB67-30058C	SPACER EVAP	PVC	1	1	
10	DB61-00011C	ASS´Y HOLDER MOTOR	ASS´Y	1	1	
11	DB31-10078H	MOTOR FAN IN	AMPFS040WTVB	1	1	
12	DB94-30141A	ASS´Y-C-F-FAN	Ø95 619.4mm	1	1	
13	DB94-40017A	ASS´Y BEARING	ASS´Y	1	1	
14	DB93-10603A	ASS´Y MAIN PCB	ASS´Y	1	-	
	DB93-00072A	ASS´Y MAIN PCB	ASS´Y	-	1	
15	DB32-10008D	ASS´Y-THERMISTOR	ASS´Y	1	1	
16	DB65-00007B	ASS´Y TERMINAL BLOCK	ASS´Y	1	1	⚠
17	DB61-10151A	CASE-CONTROL	ABS(94-5V)	1	1	
18	DB61-60093A	BODY-BUSH	HIPS	1	1	
19	DB94-20030C	ASS´Y BACK BODY	ASS´Y	1	1	
20	DB61-40247A	HOLDER PIPE	HIPS	1	1	
21	DB70-10618A	PLATE HANGER	SGCC-M	1	1	

6-1(b) AM20A1(B1)E06

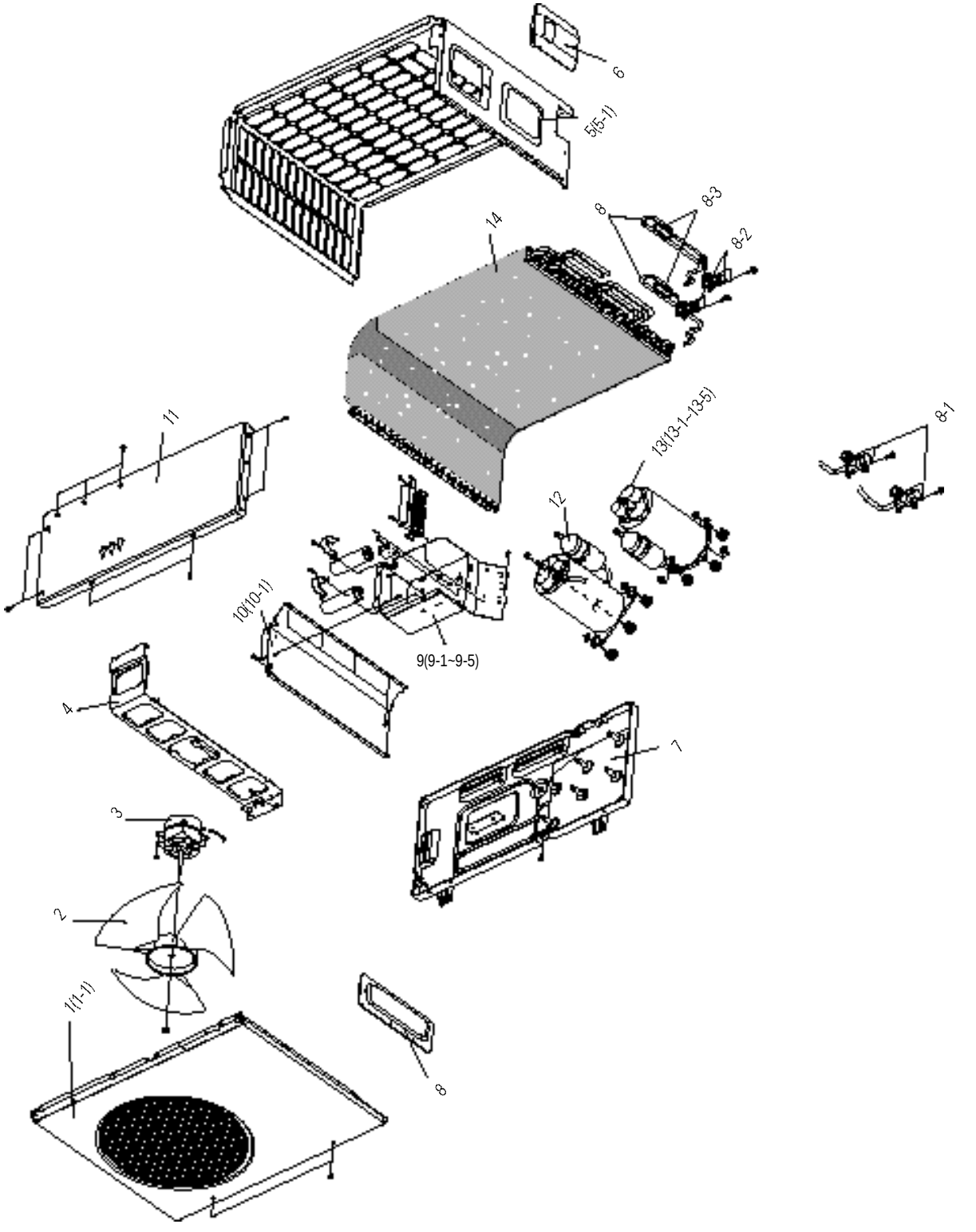


■ Parts List

No.	CODE NO	Description	Specification	Q'TY	Remark
				AM20A1(B1)E06	
1	DB64-10162A	GRILLE-AIR INLET	HIPS	1	
1-1	DB64-70098A	PANEL DISPLAY	PC	1	
2	DB63-30166B	GUARD AIR FILTER	PP	2	
3	DB74-10108D	CLEANER FILTER ASS'Y	ASS'Y	(1)	OPTION
4	DB63-10486B	COVER TERMINAL	ABS	1	
5	DB92-70093D	ASS'Y FRONT PANEL	ASS'Y	1	
6	DB93-10619B	ASS'Y DISPLAY PCB	ASS'Y	1	
7	DB94-10086D	ASS'Y-TRAY DRAIN	ASS'Y	1	
7-1	DB95-20138A	ASS'Y-STEP MOTOR U/D	GSP-24RW	1	⚠
7-2	DB66-30195A	BLADE-H	HIPS	1	
8	DB75-40091D	ASS'Y EVAP	1.2PLATE 2X2PASS	1	
9	DB67-30058D	SPACER EVAP	PVC	1	
10	DB61-40280B	ASS'Y HOLDER MOTOR	ASS'Y	1	
11	DB31-10155A	MOTOR FAN, IN	PFS027WTVA	1	⚠
12	DB94-30166A	ASS'Y C-F-FAN	ø95	1	
13	DB94-40017A	ASS'Y BEARING	ASS'Y	1	
14	DB93-10628A	ASS'Y-MAIN PCB	ASS'Y	1	⚠
15	DB32-10008D	ASS'Y THERMISTOR	103AT	1	
16	DB39-10062V	POWER CORD	250V 7A	1	
17	DB61-10178A	CASE-CONTROL	ABS	1	
18	DB61-60122A	BODY BUSH	HIPS	1	
19	DB94-20038A	ASS'Y BACK BODY	HIPS	1	
20	DB61-40247A	HOLDER PIPE	PP	1	
21	DB70-10670A	PLATE HANGER	SGCC-M	1	
22	DB93-30052Q	ASS'Y REMOCON	ARC-109	1	

6-2 Outdoor Unit (UM20A1(B1)E3)

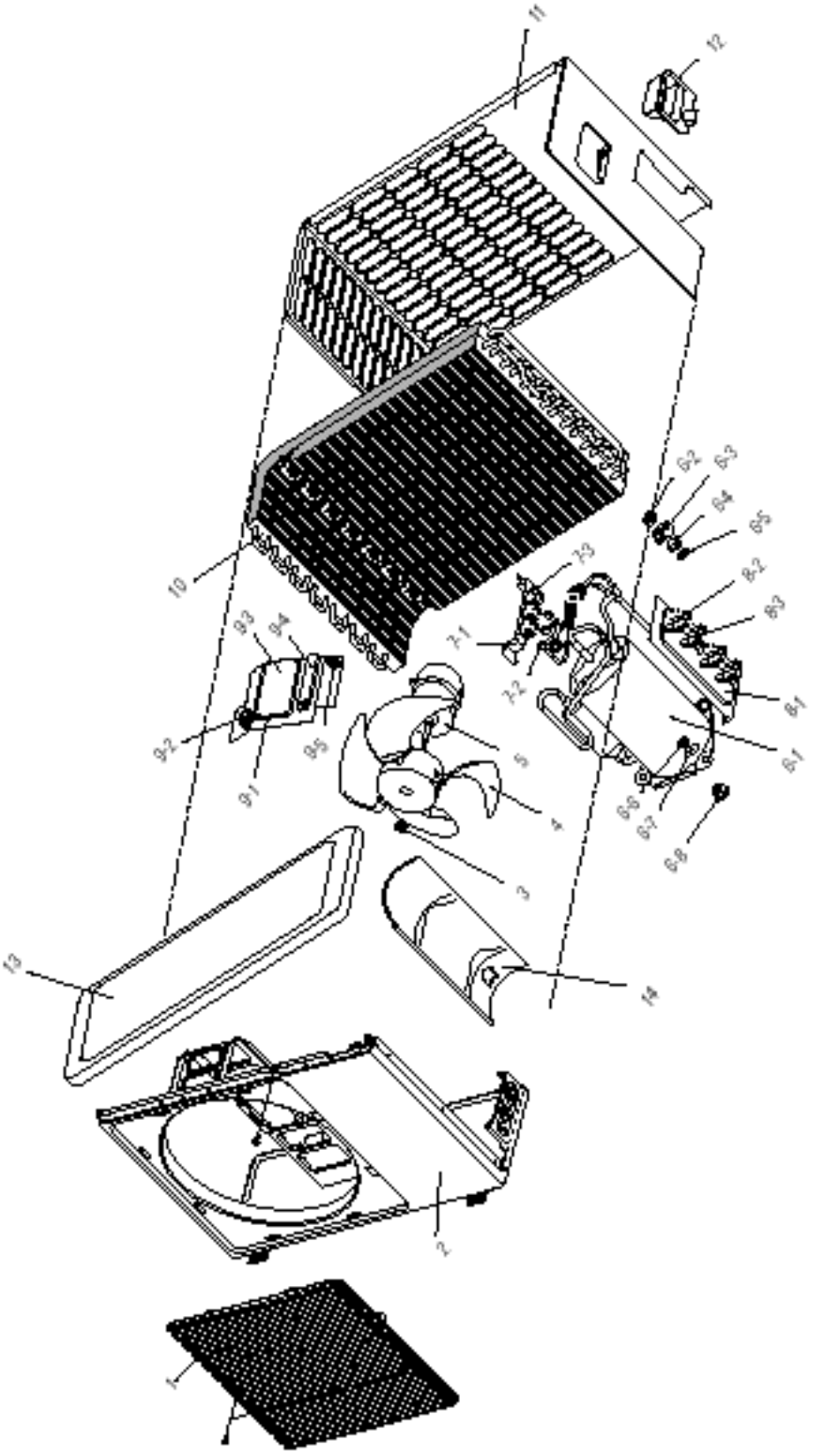
6-2(a) UM20A1(B1)E3



■ Parts List

No.	CODE NO	Description	Specification	Q'TY	Remark
				UM20A1(B1)E3	
1	DB90-10614B	ASS'Y-WELD FRONT	SC-90073T	1	
1-1	DB72-60034A	INSUL FRONT	FOAM-PU	1	
2	DB67-50063A	FAN-PROPELLER	AS+G/F20%	1	
3	DB31-00001B	MOTOR-FAN OUT	IC-9630SLJ5A	1	⚠
4	DB61-20008C	BASE-MOTOR	SGCC-M	1	
5	DB90-00073B	ASS'Y CABINET-BACK	ASS'Y	1	
5-1	DB70-00006A	CABINET-BACK	-	1	
6	DB90-40176A	ASS'Y-COVER-CONTROL	ASS'Y	1	
7	DB90-20211A	ASS'Y-BASE OUT	ASHM-1807ER	1	
8	DB99-00010A	ASS'Y-VALVE	AM20A1E3	1	
8-1	DB62-00075A	VALVE-PACKED 3/8"	3/8"	2	
	DB62-40011F	VALVE-PACKED 3/8"	3/8"	1	
8-2	DB62-00074A	VALVE-PACKED 1/4"	1/4"	2	
	DB62-00073A	VALVE-PACKED 1/4"	1/4"	1	
8-3	DB96-00082A	TUBE CAPI. A	ID 1.5 x 900	1	
	DB62-00082A	TUBE CAPI. B/C	ID 4.2 x 700	2	
9	DB93-00182A	ASS'Y CONTROL OUT	-	1	⚠
9-1	DB61-10199A	CASE-CONTROL	SGCC-M	1	
9-2	DB61-10200A	CASE PCB OUT	P.P	2	
9-3	2501-001062	C-OIL	30μF x 420V	1	
	2501-001179	C-OIL	40μF x 450V	1	
9-4	DB65-40072C	TERMINAL BLOCK	8P	1	
9-5	2501-001066	C-OIL	2.5μF x 450V	1	
10	DB67-30071B	PARTITION	SECC-P	1	
10-1	DB72-60034H	INSUL PARTITION	Foam pu + Foam pe	1	
11	DB63-10011A	COVER-TOP	SECC-P	1	
12	DB95-10065N	ASS'Y-COMP	44B092JW1E6	1	
13	DB95-00016B	ASS'Y-COMP	44B102JW1EG	1	⚠
13-1	DB73-10004A	GROMMET-ISOLATOR	EPDM	6	
13-2	DB60-30028A	NUT-WASHER	M8	6	
13-3	DB60-30018A	NUT-FLANGE	P10.8	2	
13-4	DB63-10165B	COVER-TERMINAL	NORYL	2	
13-5	DB47-20002B	OLP	MRA12037-12007	1	
	DB47-20057R	OLP	MRA12054-12008	1	
14	DB96-00057A	ASSY-COND	ASS'Y	1	

6-2(b) UM14A1(B1)E2

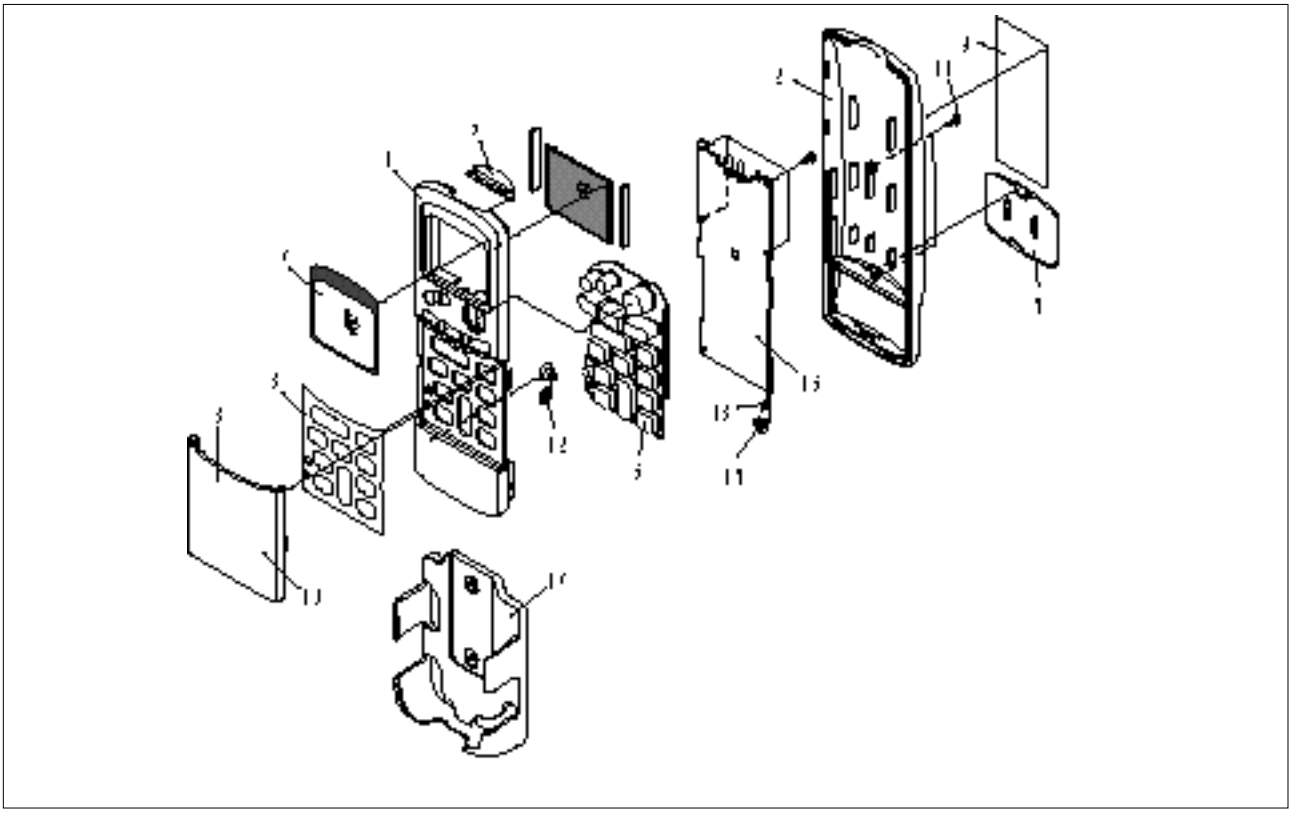


■ Parts List

No.	CODE NO	Description	Specification	Q'TY	Remark
				UM14A1(B1)E2	
1	DB63-30004B	Guard-fan	SC-90073TR	1	
2	DB90-50151A	Ass'y-cabi front	ASS'Y	1	
3	DB60-30018A	Nut-flange	M6 LF	1	
4	DB67-50063A	Fan-propeller	PP+G/F 20%	1	
5	DB31-10058C	Motor-fan out	AMASS-020WTVA	1	⚠
6-1	DB95-10062Y	Compressor	48A124JV1E5	1	
6-2	DB60-30018A	Nut-flange	SM20C M5	1	
6-3	DB63-10165B	Terminal-cover	GE NORYL	1	
6-4	DB47-20001Z	Relay-over load	MRA12030-12008	1	
6-5	DB67-60020A	Olp-spring	STS304-WPA	1	
6-6	6021-000124	Nut-hex	1-M8	3	
6-7	DB60-50008A	Washer-comp	SBC1	3	
6-8	DB73-10004A	Isolator-grommet	EPDM	3	
7-1	DB99-10147A	ASS'Y-SOLENOID V/V BRIK	ASS'Y	-	
7-2	DB62-40045A	V/V SOLENOID	220/240V 50Hz	3	⚠
7-3	DB27-10006B	SOLENOID COIL	220/240V 50Hz	3	⚠
8-1	DB99-10146A	ASS'Y-VALVE	ASS'Y	-	
8-2	DB62-40110A	PACKED V/V	1/4"	2	
8-3	DB62-40073B	PACKED V/V	3/8"	2	
9-1	DB93-00085A	ASS'Y-CONTROL OUT	ASS'Y	-	
9-2	DB26-10063C	POWER-TRANS	DC17V	1	⚠
9-3	DB93-10618A	ASS'Y-MAIN-PCB (OUT)	-	1	
9-4	2501-001145	CAPACITOR	30/1.2μF, 450VAC	1	
10	DB96-00051A	ASS'Y-CONDENSER	ASS'Y	1	
11	DB64-60039B	CABI-SIDE	SC-90073T	1	
12	DB63-10443C	COVER-E-PARTS	ABS	1	
13	DB64-60138B	CABI-UPPER	SC-90073T	1	
14	DB94-00005A	PARTITION	SBHGI	1	

6-3 Remote Control & PCB Box

6-3-1 Remote Control

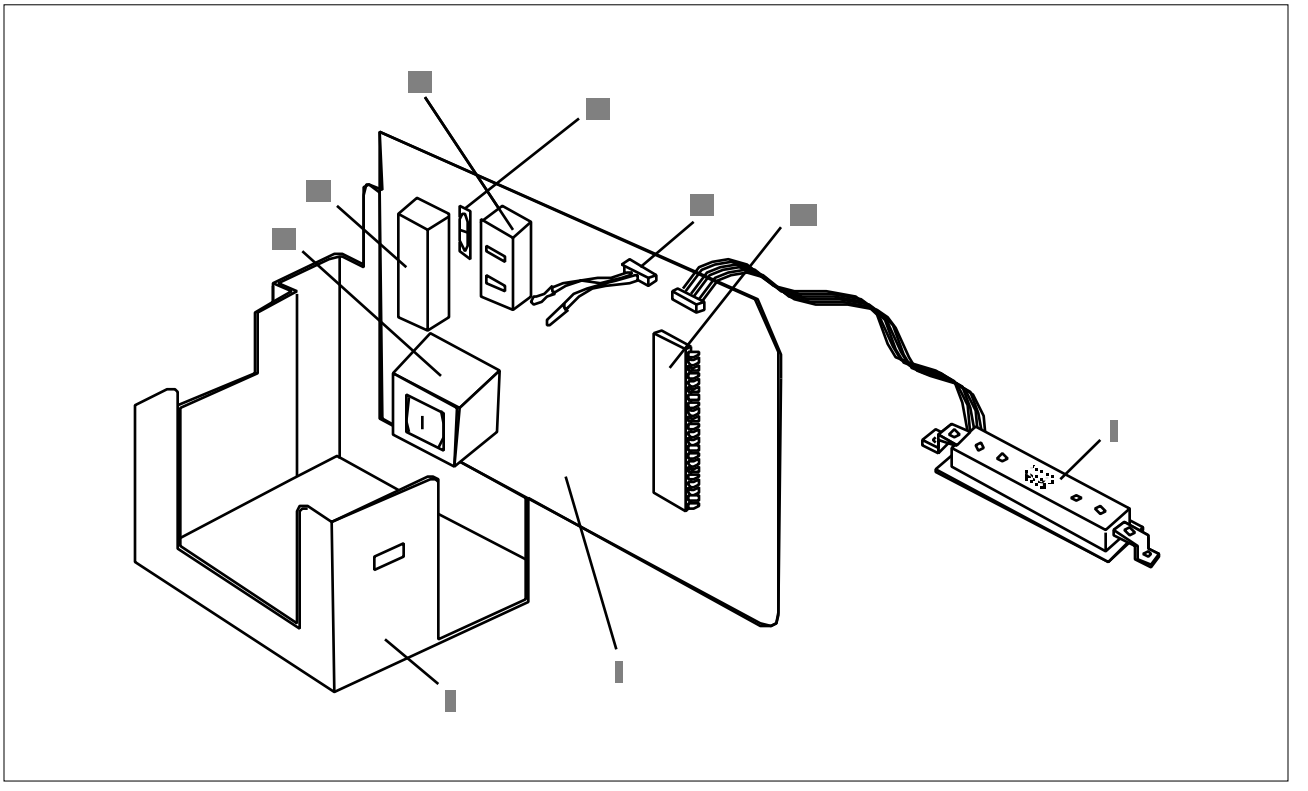


■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
		ASS'Y CODE			
1	DB61-10144A	CASE UP	ABS	1	
2	DB61-10145A	CASE LOW	ABS	1	
3	DB64-20054A	DOOR REMOCON	ABS	1	
4	DB63-10477A	COVER BATTERY	ABS	1	
5	DB74-10084A	FILTER REMOCON	PC	1	
6	DB73-20110B	RUBBER REMOCON	SILICON	1	
7	DB64-40167A	INLAY LCD	PC	1	
8	DB64-40166B	INLAY REMOCON	PC	1	
9	DB68-10775A	LABEL REMOCON	ART 90	1	
10	DB68-10777A	LABEL DOOR	ART 90	1	
11	PH-M2	SCREW TAP	PH-M2	6	
12	DB67-60061A	SPRING BATTERY	SUS 304	1	
13	DB67-60062A	SPRING BATTERY	SUS 304	1	
14	DB67-60063A	SPRING BATTERY	SUS 304	1	
15	90 X 250	PE BAG	90 X 250	1	
16	DB93-40179B	ASS'Y PCB REMOCON		1	
17	DB61-40243A	HOLDER REMOCON	ABS	1	

6-3-2 PCB Box

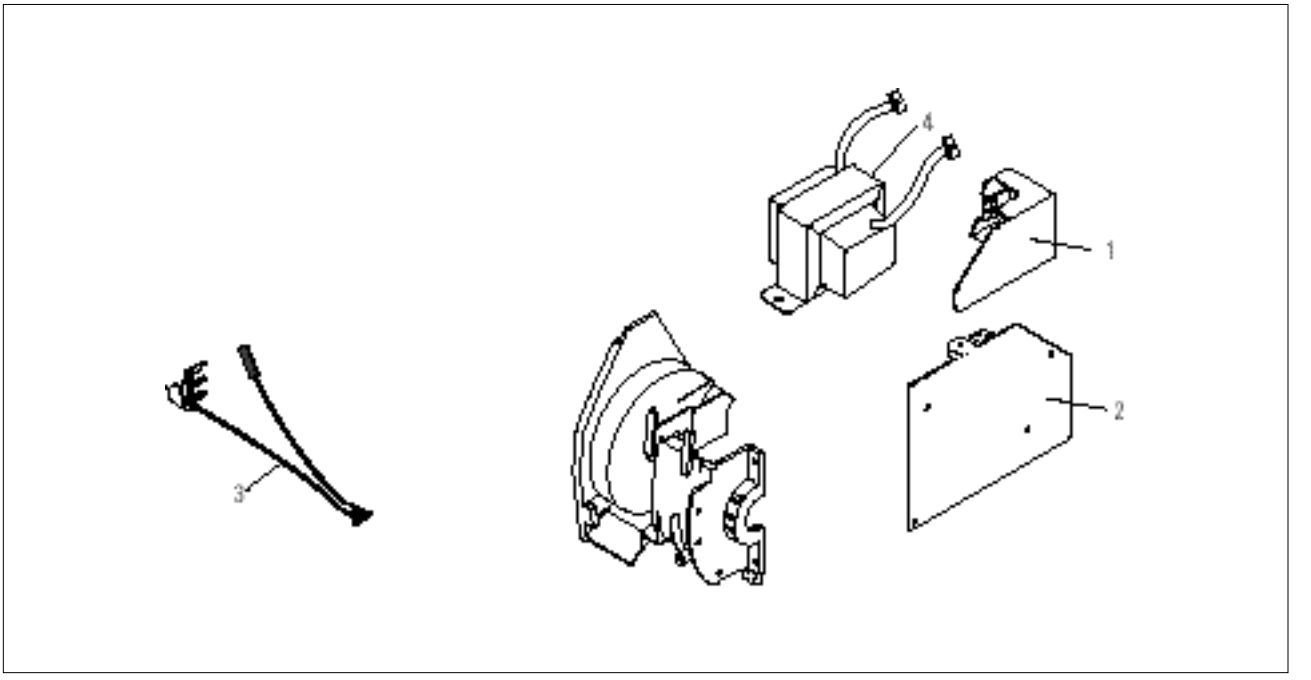
6-3-2(a) AM14A1(B1)E07, AM20A1(B1)E08



■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				AM14A1(B1)E07	AM20A1(B1)E08	
1	DB61-10151A	CASE-CONTROL	ABS(94-5V)	1	1	
2	DB93-10603A	ASS'Y MAIN PCB	ASS'Y	1	-	
	DB93-00072A	ASS'Y MAIN PCB	ASS'Y	-	1	
2-1	DB09-10149A	IC-MCU	AMB89635R-466	1	1	
2-2	DB32-10008D	THERMISTOR-ASS'Y	103AT	1	1	
2-3	DE26-20154A	TRANS-POWER	AC230V DC17V 300mA	1	1	
2-4	2306-000294	C-FILM	CFS 99N 450VAC 155K	1	1	
2-5	3501-001058	POWER-RELAY	DI1U DC12V	1	1	
2-6	DE32-10037A	FUSE	250V 3.15A	1	1	
3	DB93-10560B	ASS'Y PCB DISPLAY	AI-GRILLE	1	1	
	DB93-10561B	ASS'Y PCB DISPLAY	BI-GRILLE	1	1	

6-3-2(b) AM20A1(B1)E06



■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
				AM20A1(B1)E06	
1	DB61-10151A	CASE-CONTROL	ABS	1	
2	DB93-10628A	ASS'Y MAIN PCB	ASS'Y	1	⚠
3	DB32-10008D	ASS'Y THERMISTOR	103AT 240/240	1	
4	DB26-10063B	TRANSFORMER	AC230V/DC17	1	⚠

5. Troubleshooting

5-1 Items to be checked first

1) Is the voltage of the power correct?
The input voltage shall be rating voltage ±10% range.
The airconditioner may not operate properly if the voltage is out of this range.

2) Is the link cable linking the indoor unit and the outdoor unit linked properly?
The indoor unit and the outdoor unit shall be linked by 5 cables.
Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
Otherwise the airconditioner may not operate properly.

3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

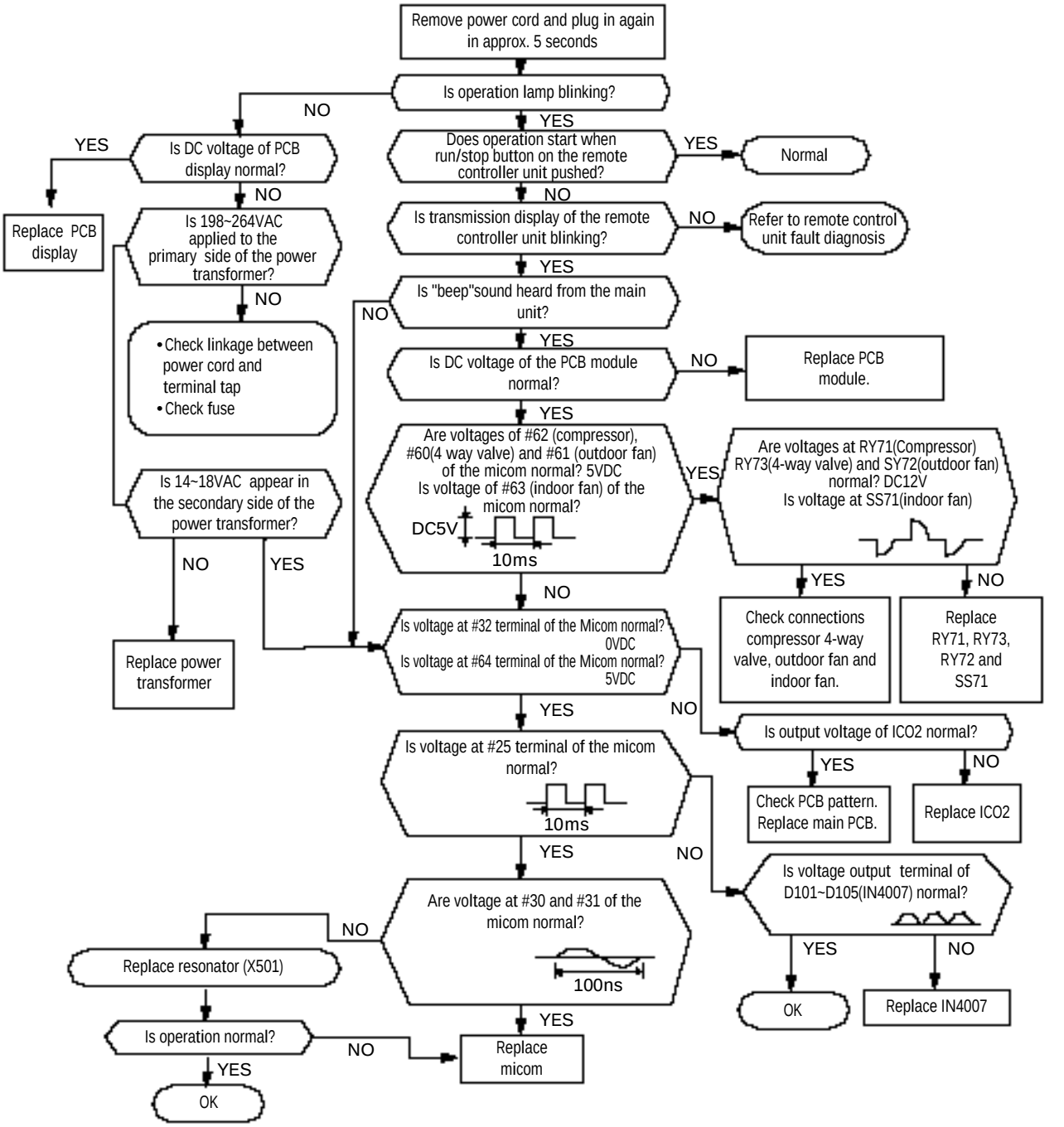
NO	Operation of air conditioner	Explanation
1	The COOL operation indication LED (Green) blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the IN DOOR FAN should operate. In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is 5 steps is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Timer LED only of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
6	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

4) Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

NO	Display	Self Diagnosis
1	Operating LED blinking (1Hz)	Restore from power failure (input initial power)
2	TIMER LED blinking (1Hz)	Indoor unit Room sensor Error (open or short)
3	OPERATING and TIMER LED blinking (1Hz)	Indoor unit heat exchanger temperature sensor Error (open or short)
4	FAN LEA blinking (1Hz)	Indoor fan malfunctioning (for spead is Below 38Orpm)

5-2-1 No Power (completely dead)-Initial diagnosis

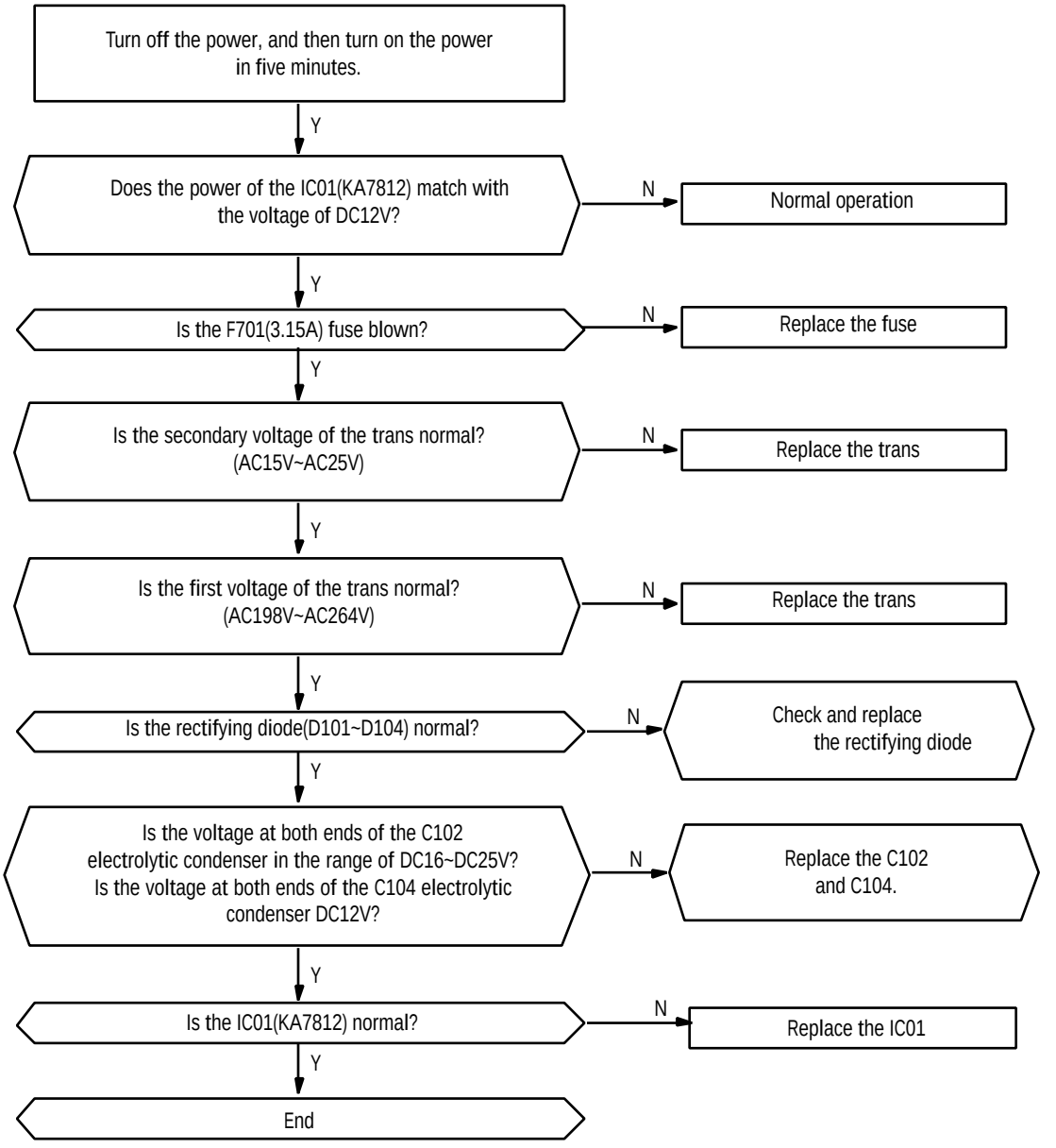
1) Checklist :
   (1) Is input voltage normal?
   (2) Is AC power linked correctly?
   (3) Are connections between primary side, secondary side of the power transformer and PCB good.
   (4) Is output voltage of DC regulator IC KA7812 (IC01) normal? (11VDC-12.5VDC)
   (5) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)



5-2-2 When the power is not applied(Outdoor unit)

1) Checking points
   (1) Is the voltage of the power normal?
   (2) Is the power line in good contact?
   (3) Are the primary (CN71) and secondary (CN11) connectors of the power trans in good contact?
   (4) Is the power voltage of the IC01 (KA7812) normal? (DC11.5V~DC12.5V)

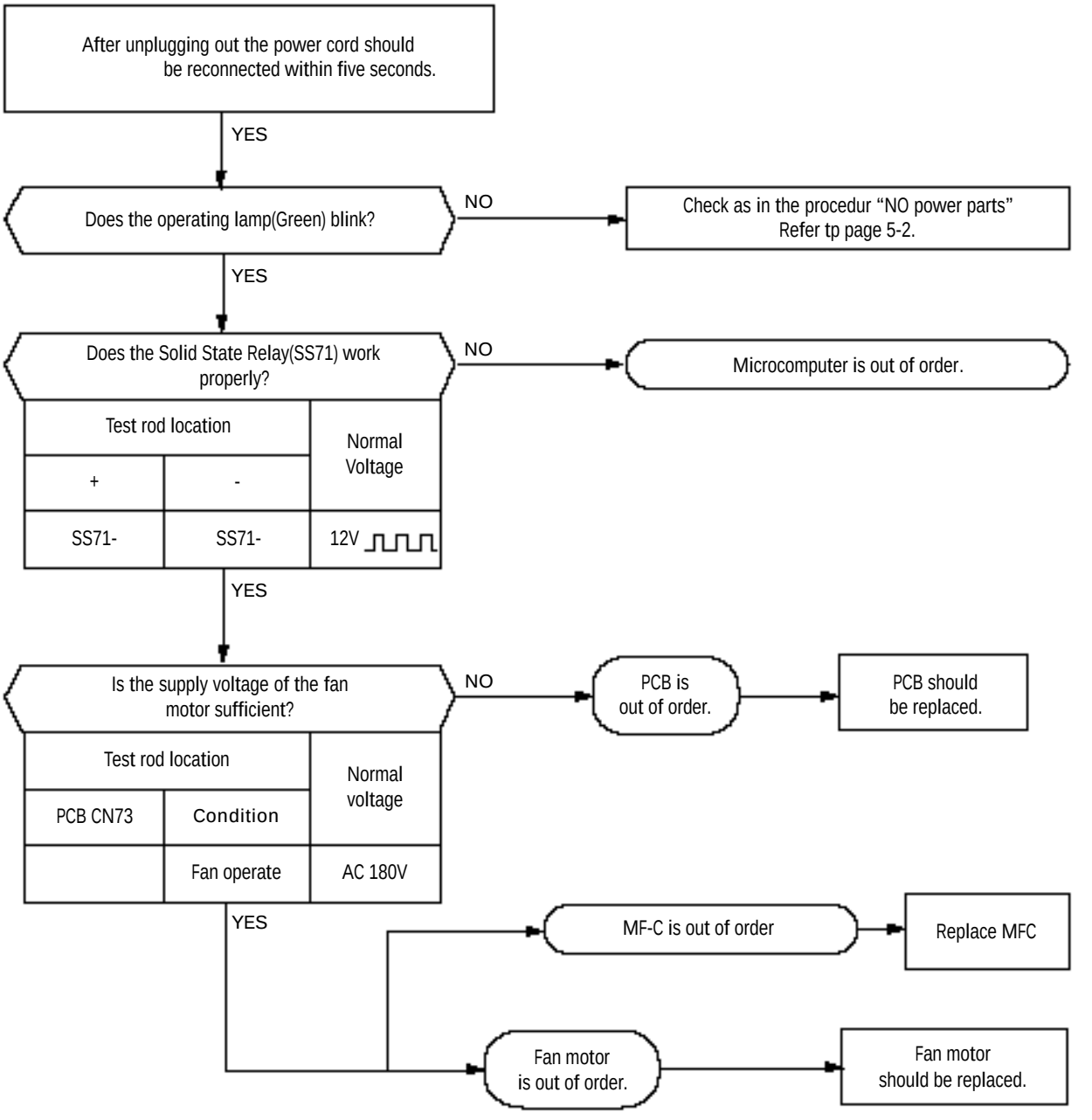
2) Trouble shooting procedure


Turn off the power, and then turn on the power in five minutes.
Y
Does the power of the IC01(KA7812) match with the voltage of DC12V?
N
Normal operation
Y
Is the F701(3.15A) fuse blown?
N
Replace the fuse
Y
Is the secondary voltage of the trans normal? (AC15V~AC25V)
N
Replace the trans
Y
Is the first voltage of the trans normal? (AC198V~AC264V)
N
Replace the trans
Y
Is the rectifying diode(D101~D104) normal?
N
Check and replace the rectifying diode
Y
Is the voltage at both ends of the C102 electrolytic condenser in the range of DC16~DC25V? Is the voltage at both ends of the C104 electrolytic condenser DC12V?
N
Replace the C102 and C104.
Y
Is the IC01(KA7812) normal?
N
Replace the IC01
Y
End

5-2-3 When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is the indoor unit fan motor properly connected with the connector (CN73)?
   (2) Is the AC voltage correct?
   (3) Is HALL IC in indoor fan motor properly connected with the connector (CN43)?
   (4) Is the running capacitor properly connected with the terminal?

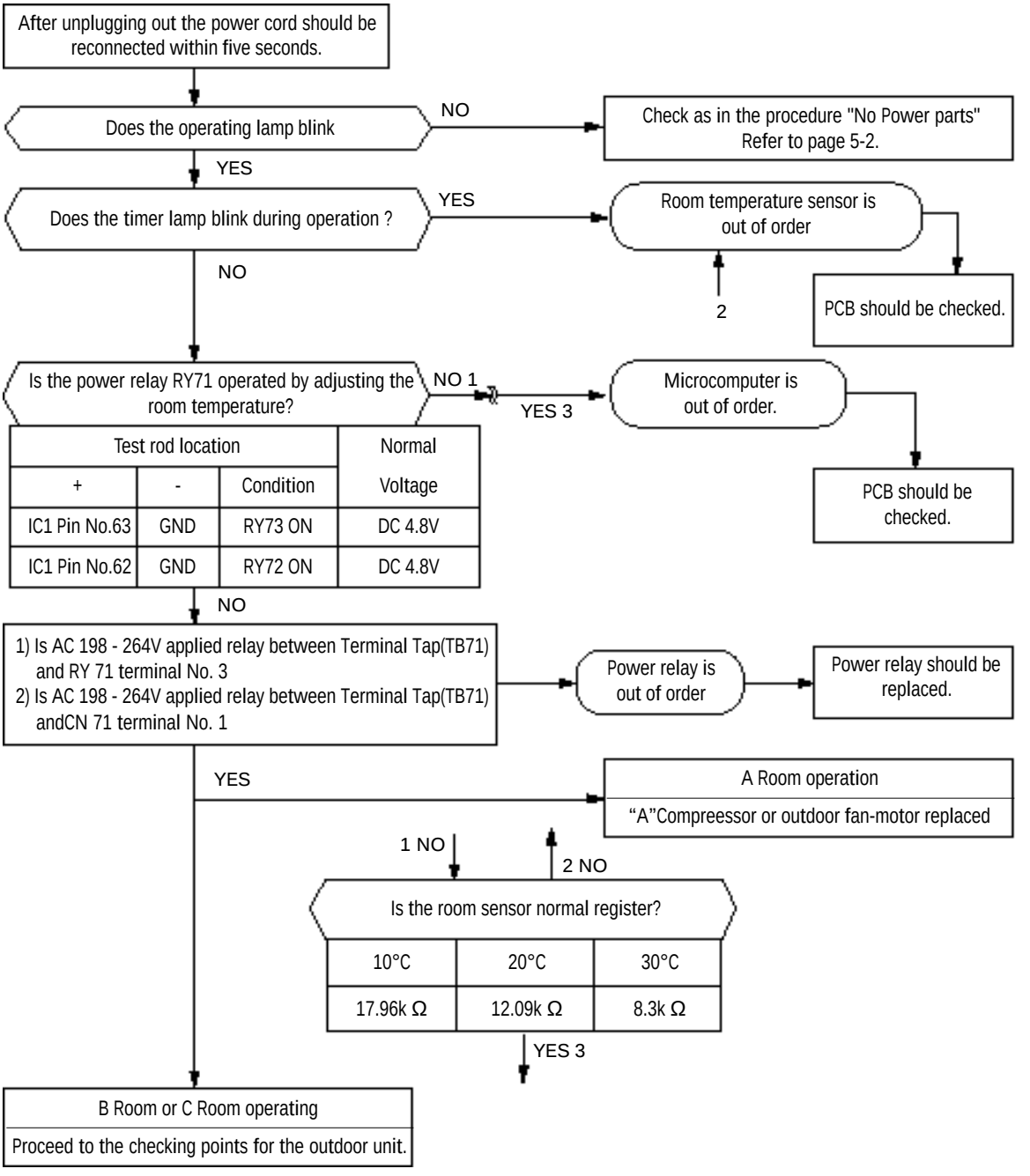
2) Troubleshooting procedure



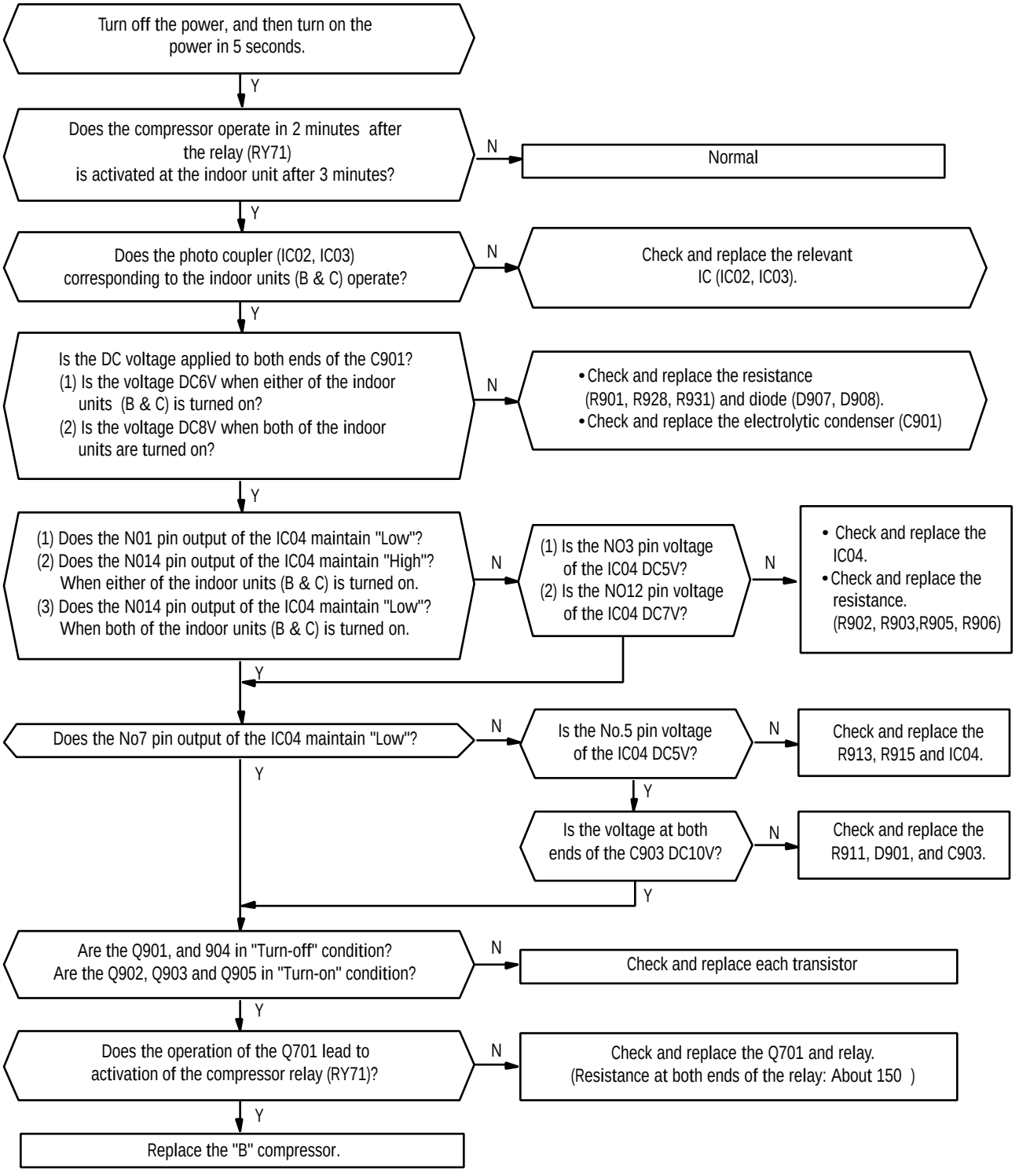
5-2-4 When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is input voltage normal?
   (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
   (3) Is the POWER IN connector (terminal-tab) linked correctly?
   (4) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(5P)?

2) Troubleshooting procedure
   (1) Checking procedures for the indoor unit.



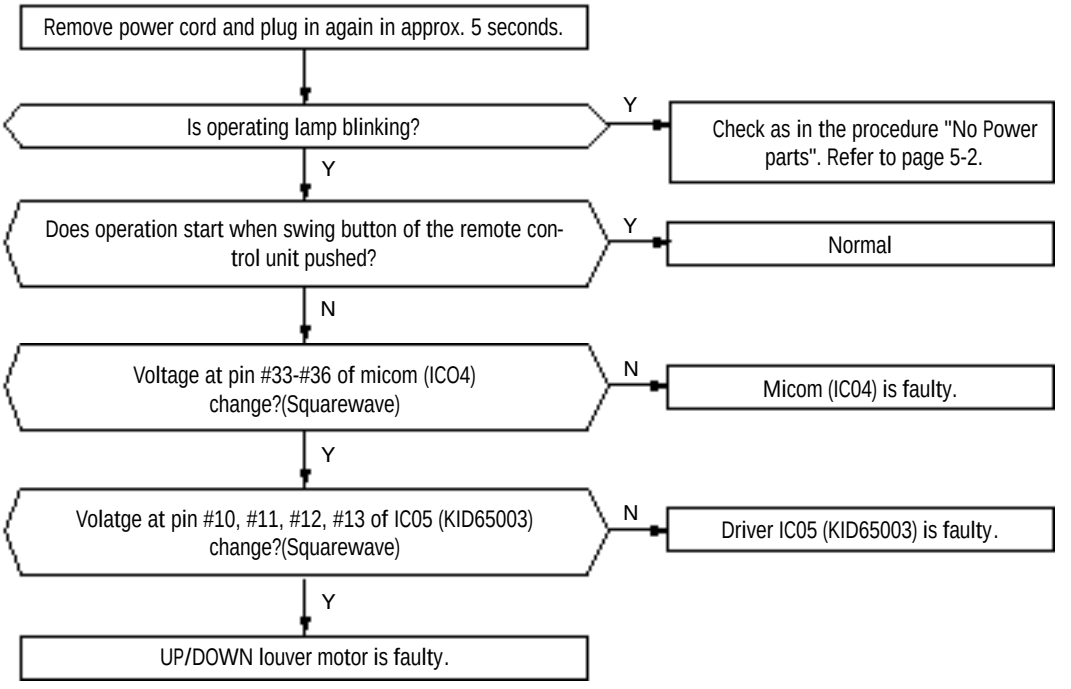
(2) Procedures for checking the outdoor unit.


Turn off the power, and then turn on the power in 5 seconds.
Y
Does the compressor operate in 2 minutes after the relay (RY71) is activated at the indoor unit after 3 minutes?
N
Normal
Y
Does the photo coupler (IC02, IC03) corresponding to the indoor units (B & C) operate?
N
Check and replace the relevant IC (IC02, IC03).
Y
Is the DC voltage applied to both ends of the C901?
(1) Is the voltage DC6V when either of the indoor units (B & C) is turned on?
(2) Is the voltage DC8V when both of the indoor units are turned on?
N
• Check and replace the resistance (R901, R928, R931) and diode (D907, D908).
• Check and replace the electrolytic condenser (C901)
Y
(1) Does the N01 pin output of the IC04 maintain "Low"?
(2) Does the N014 pin output of the IC04 maintain "High"? When either of the indoor units (B & C) is turned on.
(3) Does the N014 pin output of the IC04 maintain "Low"? When both of the indoor units (B & C) is turned on.
N
(1) Is the NO3 pin voltage of the IC04 DC5V?
(2) Is the NO12 pin voltage of the IC04 DC7V?
N
• Check and replace the IC04.
• Check and replace the resistance. (R902, R903,R905, R906)
Y
Does the No7 pin output of the IC04 maintain "Low"?
N
Is the No.5 pin voltage of the IC04 DC5V?
N
Check and replace the R913, R915 and IC04.
Y
Is the voltage at both ends of the C903 DC10V?
N
Check and replace the R911, D901, and C903.
Y
Y
Are the Q901, and 904 in "Turn-off" condition?
Are the Q902, Q903 and Q905 in "Turn-on" condition?
N
Check and replace each transistor
Y
Does the operation of the Q701 lead to activation of the compressor relay (RY71)?
N
Check and replace the Q701 and relay. (Resistance at both ends of the relay: About 150)
Y
Replace the "B" compressor.

5-2-5 When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

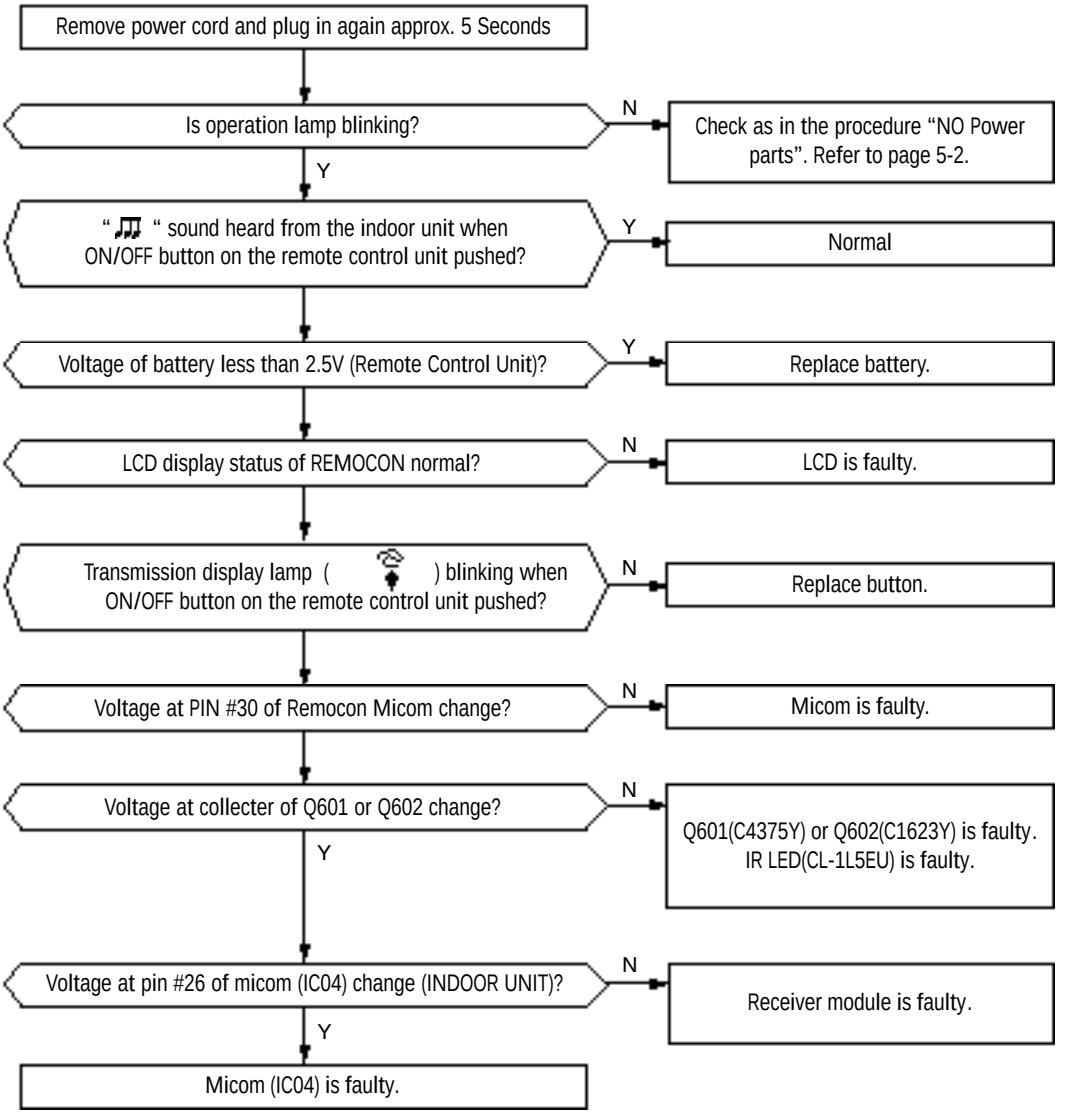
1) Checklist :
   (1) Is input voltage normal?
   (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?

2) Troubleshooting procedure


Remove power cord and plug in again in approx. 5 seconds.
Is operating lamp blinking?
Y
Check as in the procedure "No Power parts". Refer to page 5-2.
Y
Does operation start when swing button of the remote control unit pushed?
Y
Normal
N
Voltage at pin #33-#36 of micom (ICO4) change?(Squarewave)
N
Micom (IC04) is faulty.
Y
Volatge at pin #10, #11, #12, #13 of IC05 (KID65003) change?(Squarewave)
N
Driver IC05 (KID65003) is faulty.
Y
UP/DOWN louver motor is faulty.

5-2-6 If Operation By Remote Control Unit Is Impossible. (Initial Diagnosis)

1) Troubleshooting procedure

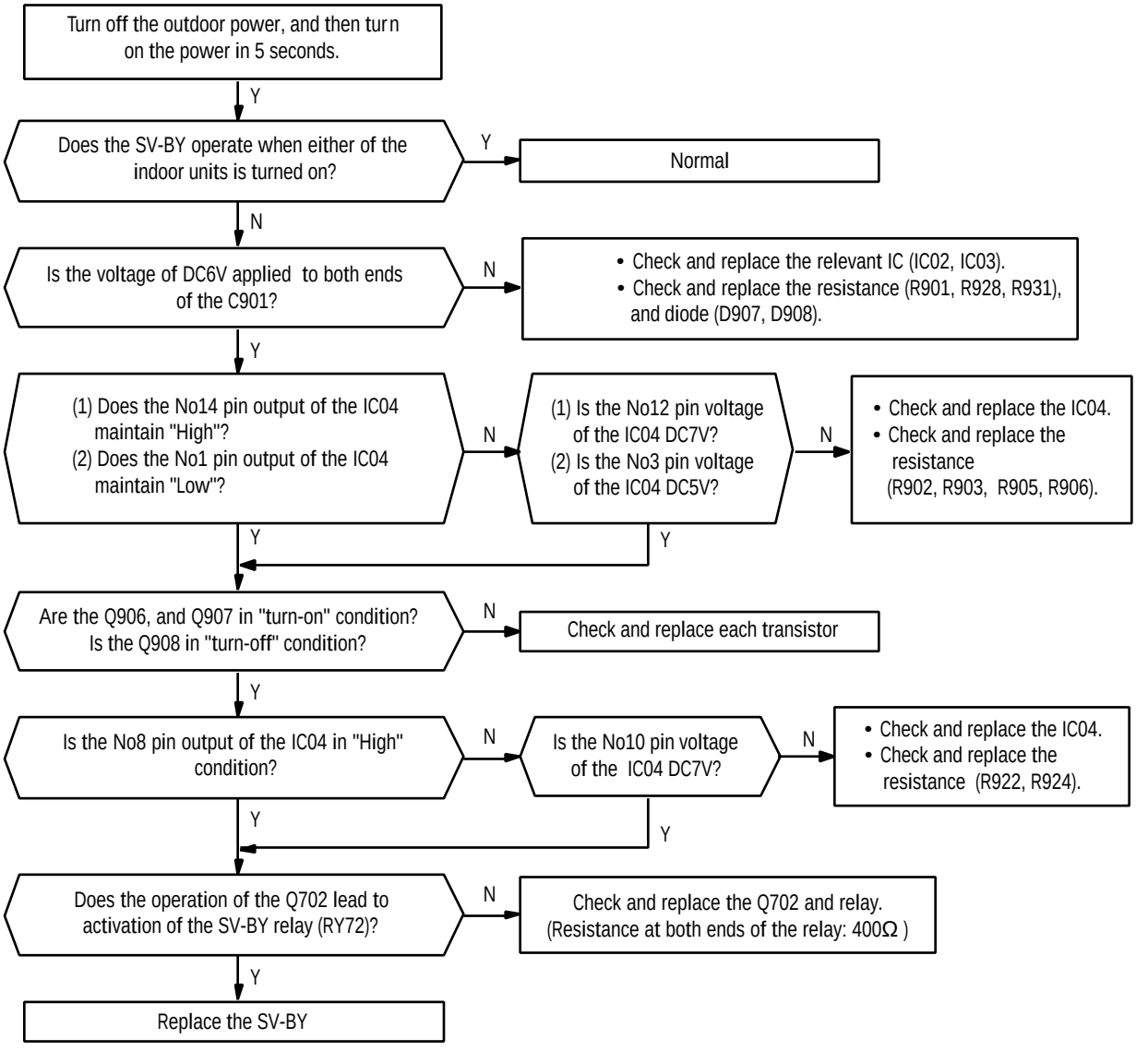

Remove power cord and plug in again approx. 5 Seconds
Is operation lamp blinking?
N
Check as in the procedure "NO Power parts". Refer to page 5-2.
Y
" ♫ " sound heard from the indoor unit when ON/OFF button on the remote control unit pushed?
Y
Normal
Voltage of battery less than 2.5V (Remote Control Unit)?
Y
Replace battery.
LCD display status of REMOCON normal?
N
LCD is faulty.
Transmission display lamp ( ) blinking when ON/OFF button on the remote control unit pushed?
N
Replace button.
Voltage at PIN #30 of Remocon Micom change?
N
Micom is faulty.
Voltage at collecter of Q601 or Q602 change?
N
Q601(C4375Y) or Q602(C1623Y) is faulty.
IR LED(CL-1L5EU) is faulty.
Y
Voltage at pin #26 of micom (IC04) change (INDOOR UNIT)?
N
Receiver module is faulty.
Y
Micom (IC04) is faulty.

5-2-7 When the SV-BY is Malfunctioning (Outdoor Unit)

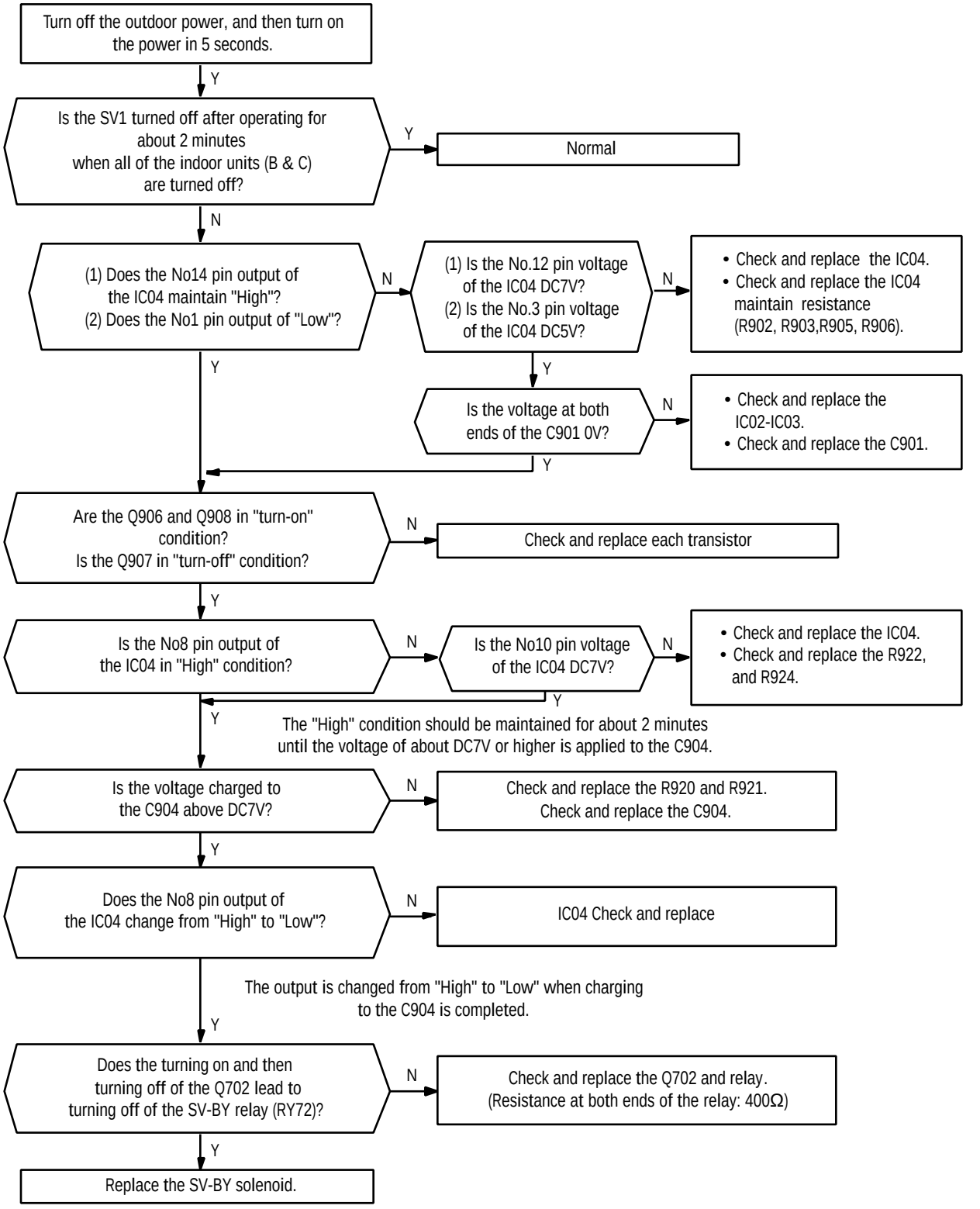
1) Checking points
   (1) Is the SV1 under normal operating condition?
   (2) Is the voltage of the power normal?
   (3) Is the connector (CN76) of the SV-BY in good contact?
   (4) Is the resistance at both ends of the solenoid about 1.4kΩ ?

2) Checking procedures

   (1) When either of the indoor units (B & C) is turned on


Turn off the outdoor power, and then turn on the power in 5 seconds.
Y
Does the SV-BY operate when either of the indoor units is turned on?
Y
Normal
N
Is the voltage of DC6V applied to both ends of the C901?
N
• Check and replace the relevant IC (IC02, IC03).
• Check and replace the resistance (R901, R928, R931), and diode (D907, D908).
Y
(1) Does the No14 pin output of the IC04 maintain "High"?
(2) Does the No1 pin output of the IC04 maintain "Low"?
N
(1) Is the No12 pin voltage of the IC04 DC7V?
(2) Is the No3 pin voltage of the IC04 DC5V?
N
• Check and replace the IC04.
• Check and replace the resistance (R902, R903, R905, R906).
Y
Y
Are the Q906, and Q907 in "turn-on" condition? Is the Q908 in "turn-off" condition?
N
Check and replace each transistor
Y
Is the No8 pin output of the IC04 in "High" condition?
N
Is the No10 pin voltage of the IC04 DC7V?
N
• Check and replace the IC04.
• Check and replace the resistance (R922, R924).
Y
Y
Does the operation of the Q702 lead to activation of the SV-BY relay (RY72)?
N
Check and replace the Q702 and relay. (Resistance at both ends of the relay: 400Ω)
Y
Replace the SV-BY

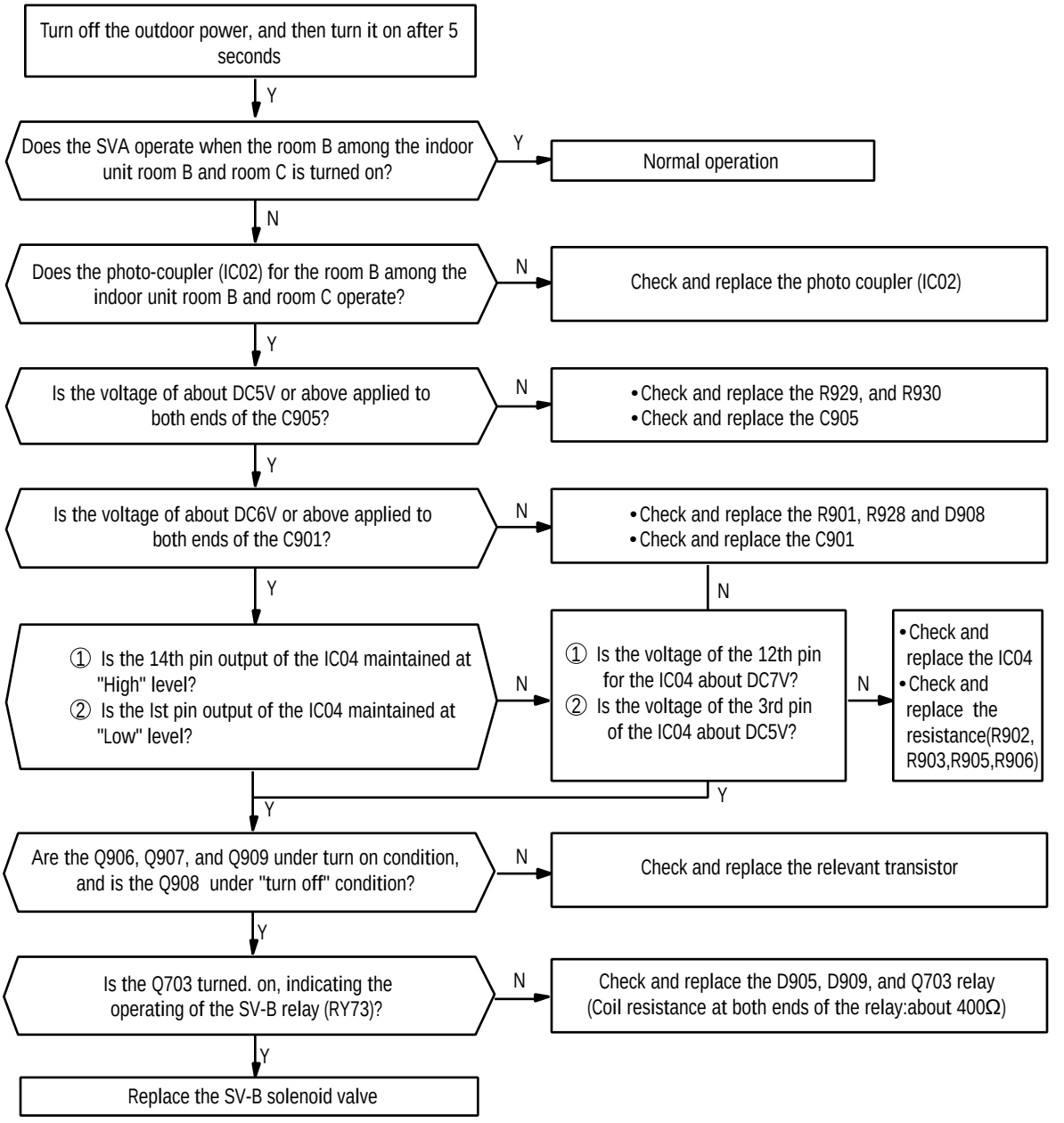
(2) When all of the indoor units (B & C) are turned off


Turn off the outdoor power, and then turn on the power in 5 seconds.
Y
Is the SV1 turned off after operating for about 2 minutes when all of the indoor units (B & C) are turned off?
Y
Normal
N
(1) Does the No14 pin output of the IC04 maintain "High"?
(2) Does the No1 pin output of "Low"?
N
(1) Is the No.12 pin voltage of the IC04 DC7V?
(2) Is the No.3 pin voltage of the IC04 DC5V?
N
• Check and replace the IC04.
• Check and replace the IC04 maintain resistance (R902, R903,R905, R906).
Y
Y
Is the voltage at both ends of the C901 0V?
N
• Check and replace the IC02-IC03.
• Check and replace the C901.
Y
Are the Q906 and Q908 in "turn-on" condition?
Is the Q907 in "turn-off" condition?
N
Check and replace each transistor
Y
Is the No8 pin output of the IC04 in "High" condition?
N
Is the No10 pin voltage of the IC04 DC7V?
N
• Check and replace the IC04.
• Check and replace the R922, and R924.
Y
Y
The "High" condition should be maintained for about 2 minutes until the voltage of about DC7V or higher is applied to the C904.
Is the voltage charged to the C904 above DC7V?
N
Check and replace the R920 and R921.
Check and replace the C904.
Y
Does the No8 pin output of the IC04 change from "High" to "Low"?
N
IC04 Check and replace
The output is changed from "High" to "Low" when charging to the C904 is completed.
Y
Does the turning on and then turning off of the Q702 lead to turning off of the SV-BY relay (RY72)?
N
Check and replace the Q702 and relay.
(Resistance at both ends of the relay: 400Ω)
Y
Replace the SV-BY solenoid.

5-2-8 When the SV-B is malfunctioning

1) Checking points
   (1) Is the SV-B under normal operating condition?
   (2) Is the voltage of the power normal?
   (3) Is the SV-B connector (CN75) in good contact?
   (4) Is the resistance at both ends of the solenoid about 1.4kΩ?

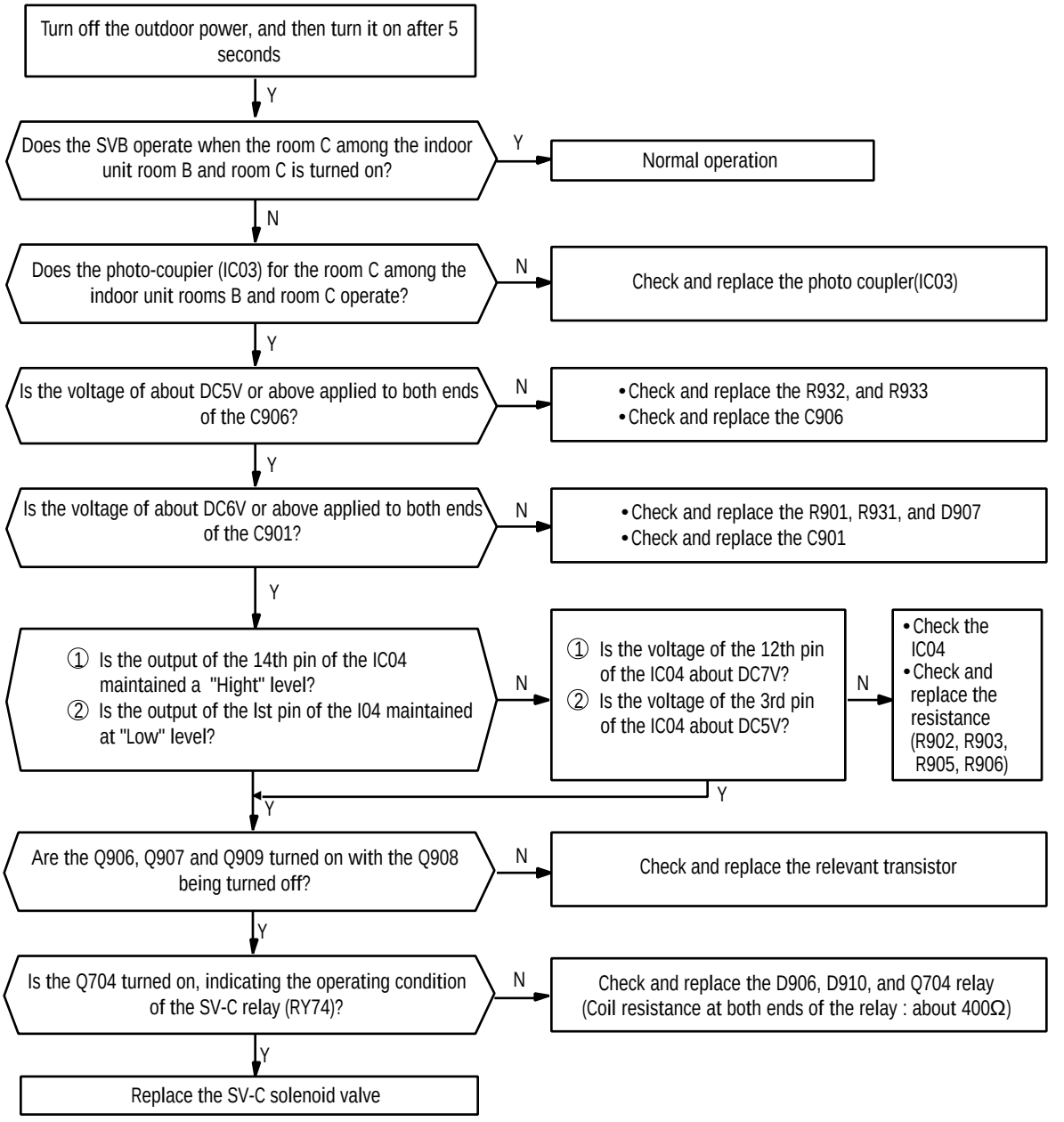
2) Checking procedures


Turn off the outdoor power, and then turn it on after 5 seconds
Y
Does the SVA operate when the room B among the indoor unit room B and room C is turned on?
Y
Normal operation
N
Does the photo-coupler (IC02) for the room B among the indoor unit room B and room C operate?
N
Check and replace the photo coupler (IC02)
Y
Is the voltage of about DC5V or above applied to both ends of the C905?
N
• Check and replace the R929, and R930
• Check and replace the C905
Y
Is the voltage of about DC6V or above applied to both ends of the C901?
N
• Check and replace the R901, R928 and D908
• Check and replace the C901
Y
N
① Is the 14th pin output of the IC04 maintained at "High" level?
② Is the Ist pin output of the IC04 maintained at "Low" level?
N
① Is the voltage of the 12th pin for the IC04 about DC7V?
② Is the voltage of the 3rd pin of the IC04 about DC5V?
N
• Check and replace the IC04
• Check and replace the resistance(R902, R903,R905,R906)
Y
Y
Are the Q906, Q907, and Q909 under turn on condition, and is the Q908 under "turn off" condition?
N
Check and replace the relevant transistor
Y
Is the Q703 turned. on, indicating the operating of the SV-B relay (RY73)?
N
Check and replace the D905, D909, and Q703 relay (Coil resistance at both ends of the relay:about 400Ω)
Y
Replace the SV-B solenoid valve

5-2-9 When the SV-C is malfunctioning

1) Checking point
   (1) Is the SV-C under normal operating condition?
   (2) Is the voltage of the power normal?
   (3) Is the SV-C connector (CN74) in good contact?
   (4) Is the resistance at both ends of the solenoid about 1.4kΩ?

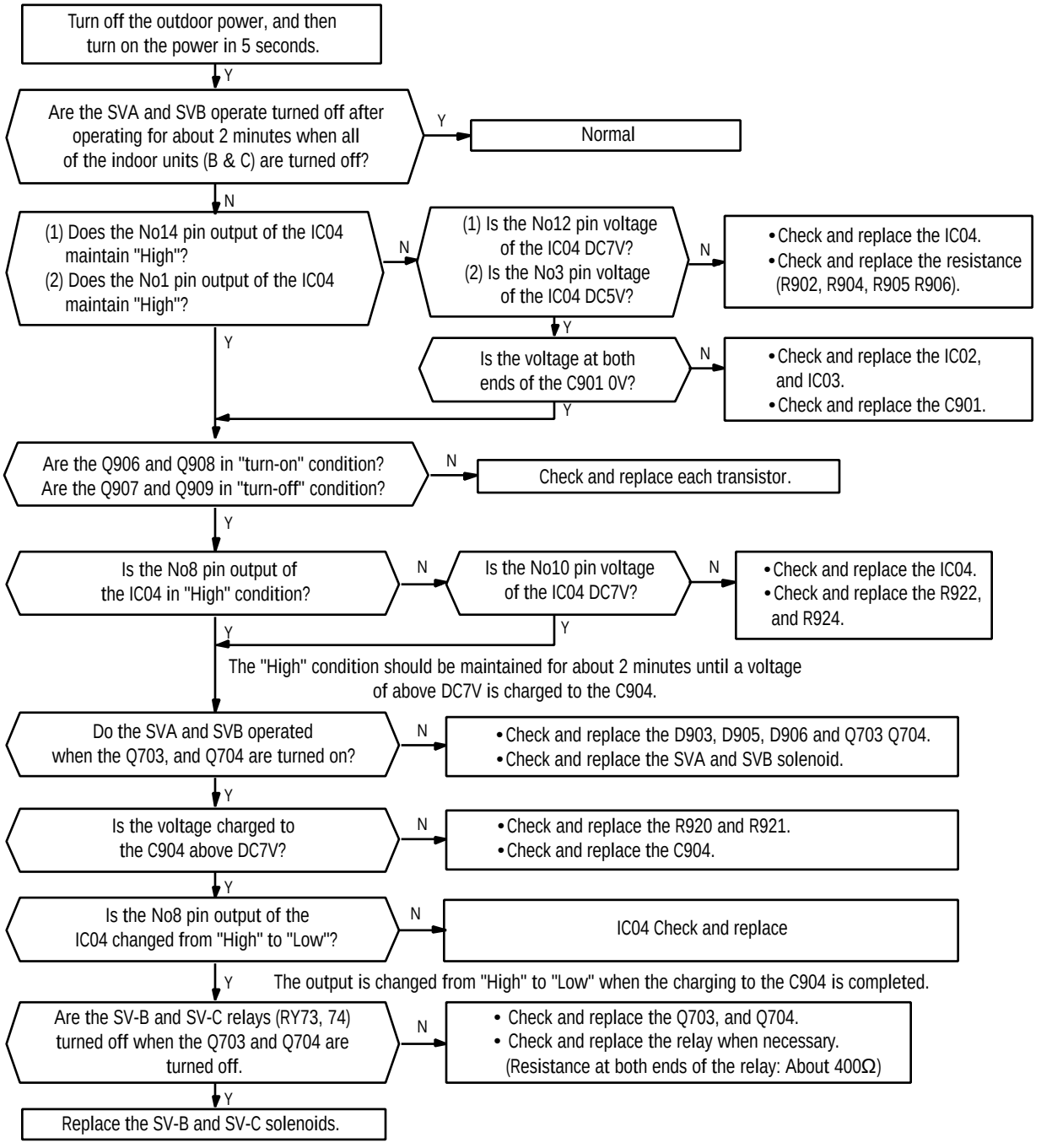
2) Checking procedures


Turn off the outdoor power, and then turn it on after 5 seconds
Y
Does the SVB operate when the room C among the indoor unit room B and room C is turned on?
Y
Normal operation
N
Does the photo-coupier (IC03) for the room C among the indoor unit rooms B and room C operate?
N
Check and replace the photo coupler(IC03)
Y
Is the voltage of about DC5V or above applied to both ends of the C906?
N
• Check and replace the R932, and R933
• Check and replace the C906
Y
Is the voltage of about DC6V or above applied to both ends of the C901?
N
• Check and replace the R901, R931, and D907
• Check and replace the C901
Y
① Is the output of the 14th pin of the IC04 maintained a "Hight" level?
② Is the output of the Ist pin of the I04 maintained at "Low" level?
N
① Is the voltage of the 12th pin of the IC04 about DC7V?
② Is the voltage of the 3rd pin of the IC04 about DC5V?
N
• Check the IC04
• Check and replace the resistance (R902, R903, R905, R906)
Y
Y
Are the Q906, Q907 and Q909 turned on with the Q908 being turned off?
N
Check and replace the relevant transistor
Y
Is the Q704 turned on, indicating the operating condition of the SV-C relay (RY74)?
N
Check and replace the D906, D910, and Q704 relay
(Coil resistance at both ends of the relay : about 400Ω)
Y
Replace the SV-C solenoid valve

5-2-10 When the SV-B and SV-C are malfunctioning with all of the indoor units (B & C) turned off

1) Checking points
   (1) Are the SVA and SVB under normal operating condition?
   (2) Is the voltage of the power normal?
   (3) Are the SV-B (CN75) and SV-C (CN74) connectors in good contact?
   (4) Is the resistance at both ends of the solenoid about 1.4kΩ?

2) Checking procedures


Turn off the outdoor power, and then turn on the power in 5 seconds.
Y
Are the SVA and SVB operate turned off after operating for about 2 minutes when all of the indoor units (B & C) are turned off?
Y
Normal
N
(1) Does the No14 pin output of the IC04 maintain "High"?
(2) Does the No1 pin output of the IC04 maintain "High"?
N
(1) Is the No12 pin voltage of the IC04 DC7V?
(2) Is the No3 pin voltage of the IC04 DC5V?
N
• Check and replace the IC04.
• Check and replace the resistance (R902, R904, R905 R906).
Y
Y
Is the voltage at both ends of the C901 0V?
N
• Check and replace the IC02, and IC03.
• Check and replace the C901.
Y
Are the Q906 and Q908 in "turn-on" condition?
Are the Q907 and Q909 in "turn-off" condition?
N
Check and replace each transistor.
Y
Is the No8 pin output of the IC04 in "High" condition?
N
Is the No10 pin voltage of the IC04 DC7V?
N
• Check and replace the IC04.
• Check and replace the R922, and R924.
Y
Y
The "High" condition should be maintained for about 2 minutes until a voltage of above DC7V is charged to the C904.
Do the SVA and SVB operated when the Q703, and Q704 are turned on?
N
• Check and replace the D903, D905, D906 and Q703 Q704.
• Check and replace the SVA and SVB solenoid.
Y
Is the voltage charged to the C904 above DC7V?
N
• Check and replace the R920 and R921.
• Check and replace the C904.
Y
Is the No8 pin output of the IC04 changed from "High" to "Low"?
N
IC04 Check and replace
Y
The output is changed from "High" to "Low" when the charging to the C904 is completed.
Are the SV-B and SV-C relays (RY73, 74) turned off when the Q703 and Q704 are turned off.
N
• Check and replace the Q703, and Q704.
• Check and replace the relay when necessary. (Resistance at both ends of the relay: About 400Ω)
Y
Replace the SV-B and SV-C solenoids.

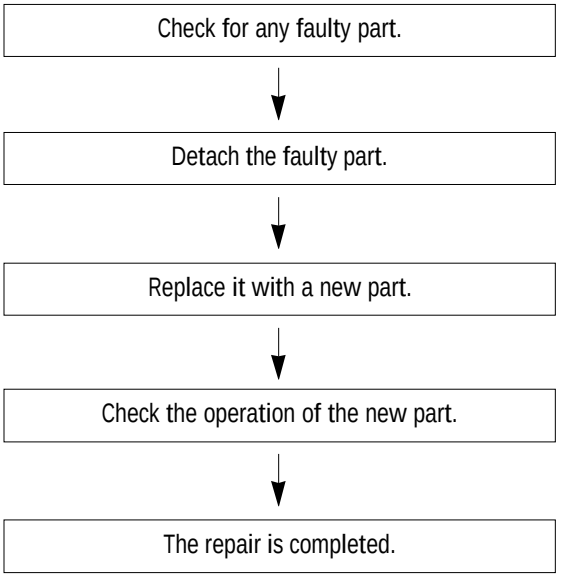
5-3 PCB Inspection

5-3-1 Cautions for Part Replacement

1. The human body carries much static electricity. Before touching a part for repair, replacement or the similar purpose, be sure to touch a grounded metallic portion by hand to let the static electricity go through the matallic portion to the earth. Especially when handling any micro computer or IC, carefully remove such static electricity before touching them.
2. When repairing any part on a work bench, be sure to place an insulative sheet on the bench and always keep the sheet surface neat without any metal fragments. If any such fragment touches a part, a secondary trouble will possibly be caused in the part.
3. Before replacing any parts, be sure to turn off the power supply. If such replacement is done with the power supply kept on, an electric shock, short circuit or destruction of a part may result.
4. During replacement or repair of a part, carefully handle it : The printed circuit board has fine lead wires (jumper wires) and glass-made parts (diode) on its substrate. So if a circuit board is roughly handled, such lead wires and parts will be easily broken or damaged by bending or shock.
5. When soldering the lead wires of any new part, be sure to polish them using an emery paper or the like before solding them. Since the lead wires of any new part are covered with an oxide film, solder cannot adhere to the lead wires if not polished.
6. When soldering any part, care should be exercised not to apply any high-wattage soldering iron to the part for a long time. Some parts are of so low a heat resistance that they may be broken or have the properties changed if a soldering iron is so applied (Otherwise, the pattern may possibly be separated and raised).
7. The heat of the soldering iron should be transfered to the entire object to be soldered. If the solder pieces are not well fused due to insufficient transfer of the heat from the soldering iron, no satisfactory electrical continuity can be assured even if the soldered objects appear well connected to each other.
8. The solder used should be limited to a minimum. If excessive solder is used, it will cause inter-pattern contact, which may cause malfunction of the circuit.

5-3-2 Procedure

The parts should be replaced in the following procedure.


Check for any faulty part.
Detach the faulty part.
Replace it with a new part.
Check the operation of the new part.
The repair is completed.

5-3-3 Detailed Procedure

No.	Malfunction	Checking point (symptoms)	Causes
1	Pull out the power plug from the AC terminal and confirm the fuse on the PCB assembly	1. Is the broken?	1. Voltage over 2. Indoor unit fan motor short-circuit.
2	Turn the power on. If lamp blinks trouble is not related to the items 1 through 4 on the right.	Voltage check	
		1. AC voltage at both end of transformer Primary? 198 - 264V~	1. Irregular power code or power fuse, or poor wiring.
		2. AC voltage at both end of transformer secondary? 14- 18Vac	2. Transformer is faulty.
		3. DC voltage at OUT and GND of IC01 (KA7812)? 12VDC	3. Power circuit is faulty.
		4. DC voltage at OUT and GND of IC02? 5VDC	4. Power circuit is faulty.
		5. DC voltage at Q201 Base and GND change? squarewave	5. Q201 is faulty. D101~D104 (IN4007)
3	Set operating mode when RMC switch pushed. Except for [FAN]mode and [TIMER] mode.	Voltage check	
		1. Voltage of relay (RY71) coil Voltage at pin#10, pin#7 of IC07 : 12VDC	1. Relay(RY 71) coil is open. IC6(ULN2003) is faulty.
		2. Voltage at Terminal Tap (TB71 or 72) and RY71 Terminal N0④. 198- 264V~	2. Relay(RY 71) contactor is faulty.
4	Set operating mode when RMC switch pushed. 1. COOL mode 2. Fan speed [AUTO] 3. Set temperature lower than room temperature 4. Continuously operation.	1. Compressor does not operate.	1. Temperature of Heat exchange is lower. 2. PCB is faulty. 3. Room sensor or Heat exchanger temperature sensor is faulty
5	Set operating mode when RMC switch pushed. 1. [FAN] mode 2. Fan speed [Hi] 3. Continuously operation	1. Voltage at ③⑤ both ends of CN73 : above 180V~ 2. Indoor unit fan motor does not operate.	1. Indoor unit fan motor is faulty. 2. Poor connection of indoor fan motor and connector of RPM sensing (CN43)

5-4 Fault Diagnosis of Major Parts

<table>
<tr><th>Parts</th><th colspan="2">Diagnosis</th></tr>
<tr><td rowspan="11">Temp.Sensor

Heat ex. Sensor

Indoor Fan Motor

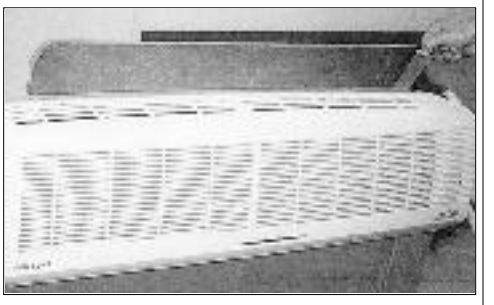
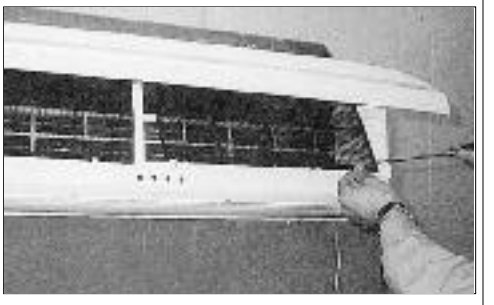
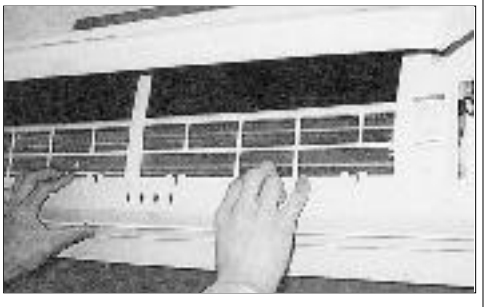
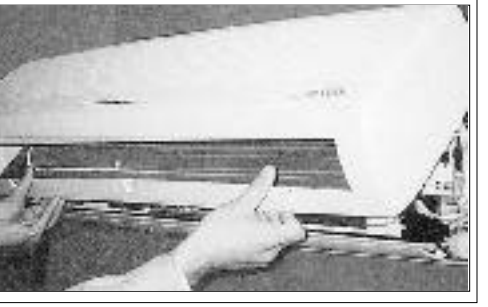
Outdoor Fan Motor</td><td colspan="2">Measure resistance with a tester.</td></tr>
<tr><td>Normal</td><td>8KΩ~27KΩ at ambient temperature (+0°C ~ +30°C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω … open or short</td></tr>
<tr><td colspan="2">Measure resistance between terminals (CN72) with a tester</td></tr>
<tr><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table>
<tr><th>between</th><th>Resistance</th></tr>
<tr><td>Red, Yellow</td><td>190±10Ω</td></tr>
<tr><td>Red, Blue</td><td>170±10Ω</td></tr>
</table></td></tr>
<tr><td>Abnormal</td><td></td></tr>
<tr><td colspan="2">Measure the voltage between ground and signal wire of the fan motor</td></tr>
<tr><td>Normal</td><td>
<table>
<tr><th>between</th><th>Voltage</th></tr>
<tr><td>Gray, Orange</td><td>0.5V~4.5V</td></tr>
<tr><td>Yellow, Orange</td><td>5V</td></tr>
</table></td></tr>
<tr><td>Abnormal</td><td>Abnormal if voltage does not change from 0V to 5V.</td></tr>
<tr><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table>
<tr><th>between</th><th>Resistance</th></tr>
<tr><td>Black, Yellow</td><td>189±10Ω</td></tr>
<tr><td>Black, Red</td><td>190±10Ω</td></tr>
</table></td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω … open or short</td></tr>
<tr><td rowspan="3">Stepping Motor

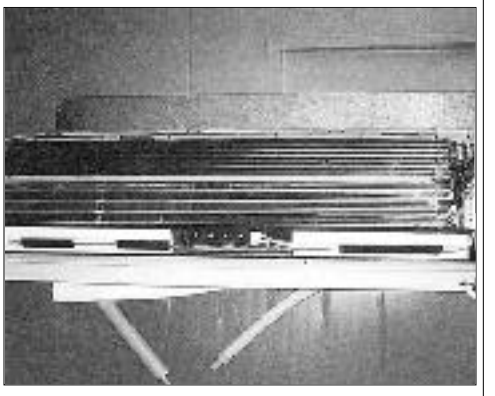
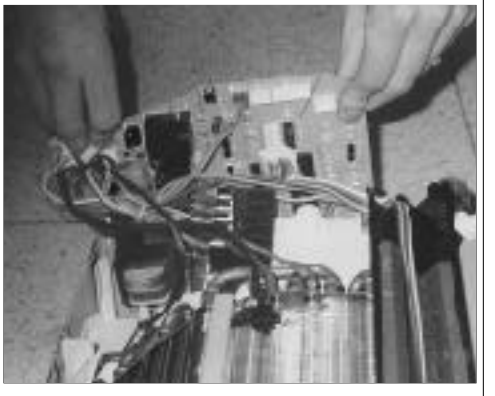
(UP/DOWN swing motor)</td><td colspan="2">Measure resistance between red wire and each terminal.</td></tr>
<tr><td>Normal</td><td>Approx. 380Ω at ambient temperature (20°C ~30°C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω … open or short</td></tr>
</table>

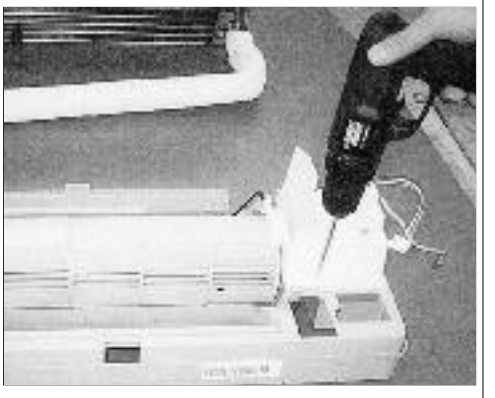
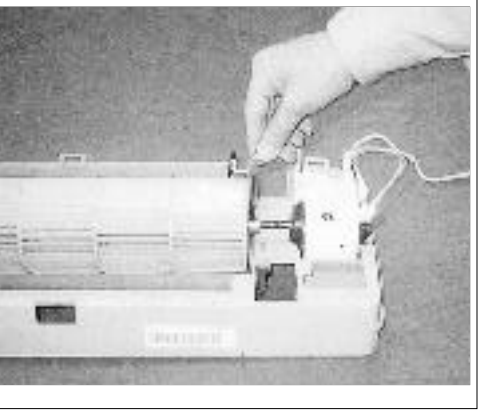
4. Disassembly and Reassembly

Stop operation of the air conditioner and remove the power cord before repairing the unit.

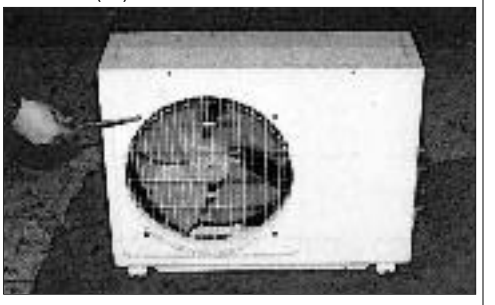
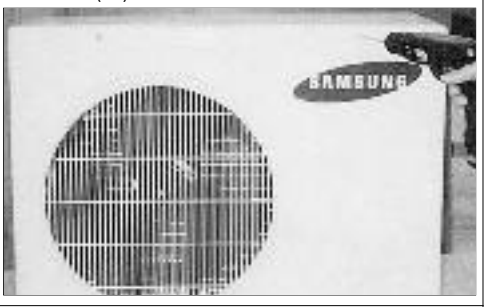
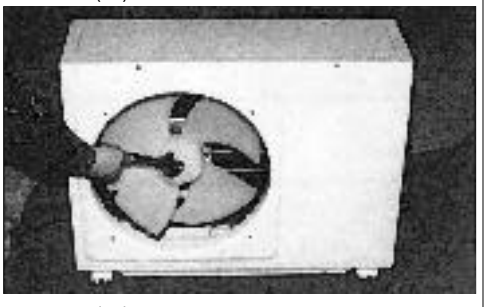
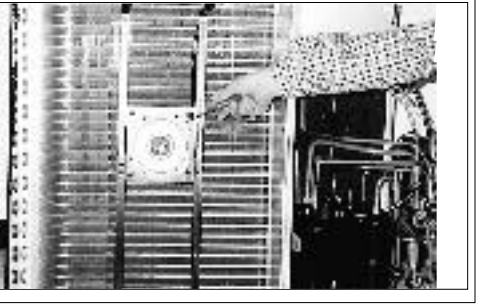
4-1 Indoor Unit

No	Parts	Procedure	Remark
1	Front Grille	1) Stop the air conditioner operation and block the main power. 2) Seperate the tape of front. Panel upper.	
		3) Contract the second finger to the left and right handle and pull to open the inlet grille. 4) Take the left and right filter out. 5) Loosen one of the right fixing screw and seperate the terminal cover.	
		6) Open the cover screw and loosen three fixing screws of front grille.	
		7) Pull the upper left and right of discharge softly for the outside cover to be pulled out.	
		8) Pull softly the lower part of discharge and push it up **Caution:** Assemble the front panel and fix the hooks of left and right.	

No	Parts	Procedure	Remark
2	Filter Frame	1) Loosen the left and right screw of the Holder Filter, and Separate the Holder Filter.	
3	Ass'y Tray Drain	1) Do ①② , above. Separate the holder at the rear side of Indoor unit. 2) Take the display PCB out. (Center of indoor unit). 3) Loosen three fixing screws of left and right. 4) Pull tray drain out from the back body.	
4	Main PCB	1) Do " ①② ", above 2) Take all the connector of PCB upper side out. 3) Separate the outdoor unit connection wire from the terminal block. 4) If pulling the Main PCB up, it will be taken out. (Separate the TRANS hook, it before).	

No	Parts	Procedure	Remark
5	Heat Exchanger	1) Do " ①②③④ ", above. 2) Loosen the left screws of the heat exchanger. Lifting the heat exchanger up a little to push the up side for separation from the indoor unit	
6	Fan Motor and Cross Fan	1) Do " ①②③④⑤ ", above. 2) Loosen the fixing two screws and separate the motor holder. 3) Loosen the fixing screw of motor fan. (By use of M3 wrench) Separate the motor from the fan. Separate the fan motor the left holder bearing.	 

4-2 Outdoor Unit

No	Parts	Procedure	Remark
1	Cabinet	1) Turn off the unit and remove the power cable 2) Remove the top cover. 3) Remove the control box cover. 4) Unplug the ass'y cable. 5) Remove the cabi-side. 6) Remove the cabi-front. * When you assemble the parts, check if the each parts and electric connectors are fixed firmly.	<UM14A1(B1)E2>  <UM20A1(B1)E3> 
2	Fan Motor & Propeller Fan	1) Do Procedure ① above. 2) Remove the nut flange. (Turn to the right to remove as it is a left turned screw) 3) Disassemble the propeller fan.	<UM14A1(B1)E2>  <UM20A1(B1)E3> 

3. Operating Instructions and Installation

3-1 Operating Instructions

3-1-1 Name & Function of Key in remote controller

NO		NAMED OF KEY		FUNCTION OF KEY
1		⏻		On/Off Button. Use this button to start and stop air conditioner.
2		🌡	▲ (UP)	Temp. up button. If the ▲button is pressed once, the setting temperature is increased by 1°C
			▼ (DOWN)	Temp. down button. If the ▼ button is pressed once, the setting temperature is decreased by 1°C
3		MODE		Each time you press this button, MODE is changed in the following order. → ❄ → 💧 → ✿
4		TURBO		Use this button to provide heavy duty cooling & Heating for 30 minutes.
5		OFF		Set up the reserve or cancel the timer on and timer off quickly
6				Use this button for sleep operation. (The SLEEP mode can be selected at COOL and HEAT mode.)
7				Adjusts air flow vertically. Each time you press this button, BLADE-H rotates by 10.58° (Changable range 42.3°)
8				Each time you press this button, FAN SPEED is changed in the following order. → ✤ → ✤✤ → ✤✤✤
9	COVER	TIMER	ON TIMER	Set up the time that operation start.
10			OFF TIMER	Set up the time that operation stop.
11			SET	Use this button to reserve the timer on.
12			CANCEL	Use this button to reserve or cancel the timer on and timer off.
13			▲ (UP)	If the ▲ button is pressed once, the time increase by one minute during the time set mode, and ten minutes during the timer set mode.
14			▼ (DOWN)	If the ▼ button is pressed once, the time decrease by one minute during the time set mode, and ten minutes during the timer set mode.
15			TIME	Without regard to ON/OFF condition in remote controller, use this button to set current time. Adjust the current time using ▲▼ button. (Data can be transmitted after setting up the time)

3-1-1 Name & Function of Key in remote controller

1. AUTO MODE : In this mode, operation COOL mode is selected automatically by the room temperature of initial operation.

Operation Type	Room Temp	
Cool Operation	Tr≥ 24.5°C+ΔT	Compressor ON
	Tr≤ 24°C+ΔT	Compressor OFF

   ΔT= -1°, -2°C, 0°C+1°C+2°C
   ΔT is controlled by setting temperature up / down key of remote controller
   * FAN SPEED : AUTO

2. COOL MODE : The unit operates according to the difference between the setting and room temperature. (18°C~30°C)

3. DRY MODE : Has 3 states, each determined by room temperature.
   The unit operates in DRY mode.
   *Compressor ON / OFF Time is controlled compulsorily(can not set up the fan speed, always breeze).
   *Protective function : Low temperature release. (Prevention against freeze)

4. TURBO MODE : This mode is available in AUTO, COOL, DRY, FAN MODE.
   When this button is pressed at first, the air conditioner is operated “powerful” state for 30 minutes regardless of the set temperature, room temperature.
   When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.
   *But, if you press the TURBO button in DRY or FAN mode that is changed with AUTO mode automatically.

5. SLEEP MODE : Sleep mode is available only in COOL mode.
   The operation will stop after 6 hours.
   *In COOL mode : The setting temperature is automatically raised by 1°C each 1hour When the temperature has been raised by total of 2°C, that temperature is maintained.

6. FAN SPEED : Manual (3 step), Auto (4 step) Fan speed automatically varies depending on both the difference between setting and the room temperature.

7. COMPULSORY OPERATION :
   For operating the air conditioner without the remote controller.
   *AUTO : The operating is the same function that AUTO MODE in the remote controller.

8. SWING : BLADE-H is rotated vertically by the stepping motor.
   *Memory louver : When ON / OFF button is pressed at stop state, the BLADE-H returns to its original location which is operating state before stop
   *Swing auto : The BLADE-H can rotate within about 10,500 in the original position set by the SWING SET button.
   *Swing Set : Press the button under the remote control is displayed on LCD the and the blades move up and down, about . If the one more time press the utton, blatles location is stop.

9. Quick OFF TIMER: OFF timer (quick timer) allows reservation or cancel the timer on and timer off quickly
   When OFF timer button is pressed at operating state, LCD displays the polling state sequentially.
   The LCD also displays the time remaining.

10. 24-Hour ON / OFF Real Setting Timer. : The air conditioner is turned ON at a specified time using ON TIMER.
    OFF TIMER : The air Conditioner is turned OFF at a specified time using OFF TIMER.
    *ON TIMER : Only timer LED lights on.
    *OFF TIMER : Both timer and operation LED lights on.
    *3 minutes delay timer.

11. SELF Diagnosis

LED DISPLAY				Check Point
operation	TIMER	FAN	Turbo	
■	○	○	○	Interruption of electric power and Power on.
○	■	○	○	Abnormal condition of the room sensor.
■	■	○	○	Abnormal condition of the indoor unit's heat exchanger sensor.
○	○	■	○	Indoor unit fan motor lock.

■ : LED blinking ○ : LED off

12. TIME SHORTENING : If the "Time short" connector pin is shorted on the main P. C. B, the compressor's three minutes delay function is cancelled, and each operation time is shortened to one fiftieth of its original time.

13. BUZZER SOUND : Whenever the ON / OFF button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep"

3-2. Outdoor unit controlling spec (Each load controlling condition)

3-2-1 Indoor unit signal(Rooms "B", and "C" signal)

1) On condition : A time point where the desired temperature at each indoor unit is +0.5°C against the current temperature. (When the compressor motor relay of each assembly main PCB is turned on.)

2) Off condition : A time point where the desired temperature at each indoor unit is against the current temperature. (When the compressor motor relay of each assembly main PCB is turned off.)

3-2-2 SV-BY control

1) On condition :
   - When only any one of the two indoor unit rooms (Rooms B and C) is turned on.
   - Force it to operate for about 2 minutes $^{+30}_{-0}$ seconds when both of the two indoor unit rooms (Rooms B and C) are turned off.

2) Off condition :
   - When all of the two indoor unit rooms (Rooms B and C) are turned on.
   - It is automatically turned off after operating for about 2 minutes $^{+30}_{-0}$ seconds when all of the two indoor unit rooms (Rooms B and C) are turned off.

3-2-3 SV-B(Indoor unit room "B" solenoid valve) control SV-C(Indoor unit room "C" solenoid valve) control

1) On condition :
   - Only the SV-B solenoid valve operate when the indoor unit room "B" is turned on.
   - Only the SV-C solenoid valve operate when the indoor unit room "C" is turned on.
   - Both of the SV-B and SV-C solenoid valves operate when all of the indoor unit room B and room C are activated.
   - When both of the indoor unit room B and room C are turned off, it is forced to operate for about 2 minutes $^{+30}_{-0}$ seconds.

2) Off condition :
   - The SV-C solenoid valve is turned off when the indoor unit room "B" is operated.
   - The SV-B solenoid valve is turned off when the indoor unit room "C" is operated.
   - When both of the indoor unit room "B" and room "C" are turned off, it is automatically turned off after operating for about 2 minutes $^{+30}_{-0}$ seconds.

3-2-4 Compressor control

1) Force the compressor to stop for 3 minutes at each indoor unit when applying power to two rooms of the indoor unit(Room "B", and room "C"). (Delayed operation for three minutes)

2) A delay time of about 2 minutes 30 seconds is set up at the outdoor unit PCB when turning it off (Both of the rooms B and C are turned off) by comparing the desired temperature at each indoor unit against the current temperature.

3) When both rooms (Rooms B and C) of the indoor unit are turned off, force the compressor to stop, and then turn on the SV-BY, SV-B (room "B" valve), and SV-C (room C valve) to achieve the pressure balance of the compressor.

4) When applying the power to the outdoor unit PCB initially, disregard the time of forcing the outdoor unit compressor (About 2 minutes $^{+30}_{-0}$ seconds).

3-2-5 Outdoor unit fan motor control (1 step)

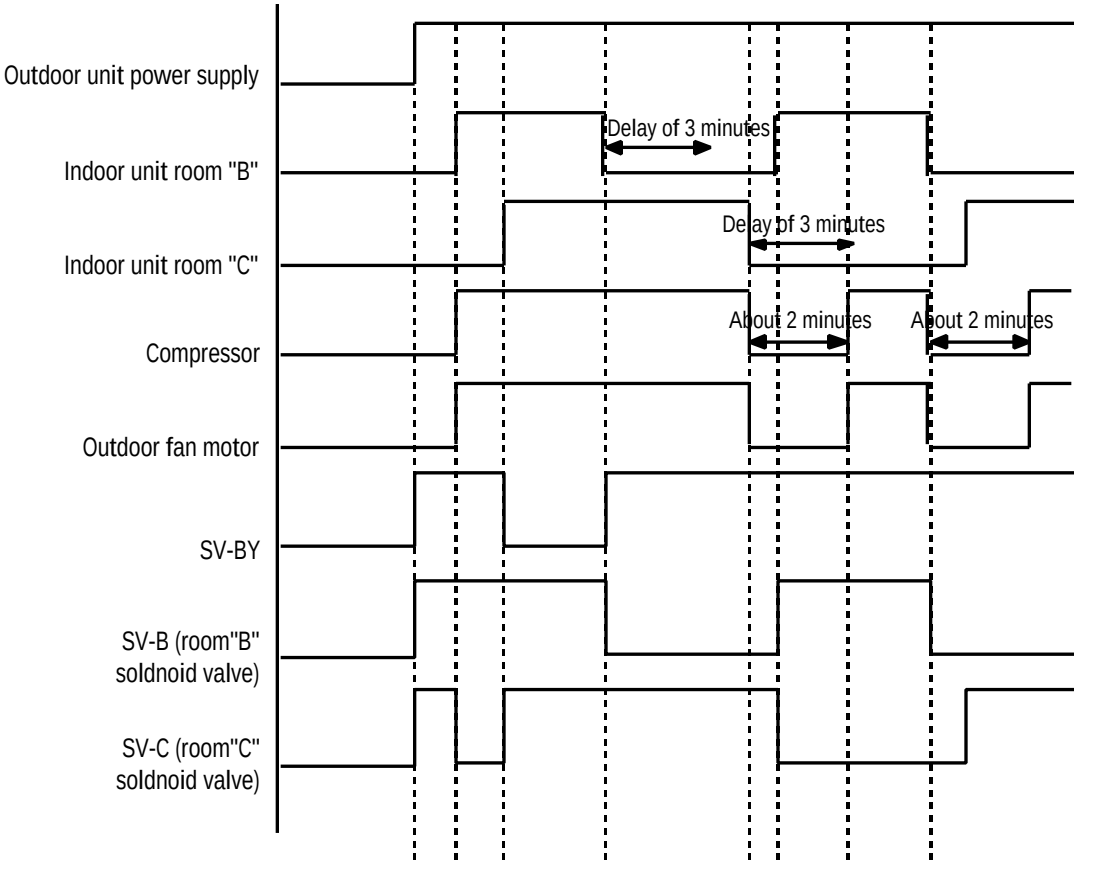
1) On condition : When the compressor is "ON".
2) Off condition : When the compressor is "OFF".
3) The motor is operated in "High" rpm mode regardless of the number of the indoor units operated.

(Note)

1. Controlling the solenoid valve of the outdoor unit according to the operation of the indoor units (Room B, Room C)

Combination of indoor units			Control of solenoid valve			Remarks
	Room "B"	Room "C"	SV-B	SV-C	SV-BY	
Room 0			•	•	•	Off after operating for about 2 minutes $^{+30}_{-0}$ seconds
Room 1	•		•		•	
	•		•	•		
Room 2	•	•	•	•		

2. Outdoor unit load time chart according to the operating conditions for the indoor unit.



3-3 Installation

3-3-1 Selecting Area for Installation

Select an area for installation that is suitable to the customer's needs.

3-3-1(a) Indoor Unit

1. Make sure that you install the indoor unit in an area providing good ventilation. It must not be blocked by an obstacle affecting the airflow near the air inlet and the air outlet.
2. Make sure that you install the indoor unit in an area allowing good air handling and endurance of vibration of the indoor unit.
3. Make sure that you install the indoor unit in an area where there is no source of heat or vapor nearby.
4. Make sure that you install the indoor unit in an area from which hot or cool air is spread evenly in a room.
5. Make sure that you install the indoor unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).
6. Make sure that you install the indoor unit in an area which provides easy pipe connection with the outdoor unit, and easy drainage for condensed water.
7. Make sure that you install the indoor unit in an area which is large enough to accomodate the measurements shown in figure on the next page.

3-3-1(b) Outdoor Unit

1. Make sure that you install the outdoor unit in area not exposed to the rain or direct sun light.
   (Install a separate sunblind if exposed to direct sun light.)
2. Make sure that you install the outdoor unit in area allowing good air moment, not amplifying noise or vibration, especially to avoid disturbing neighbours.
   (Fix the unit firmly if it is mounted in a high place.)
3. Make sure that you install the outdoor unit in area providing good ventilation and which is not dusty. It must not be blocked by any obstacle affecting the airflow near the air inlet and the air outlet.
4. Make sure that you install the outdoor unit in area free from animals or plants.
5. Make sure that you install the outdoor unit in area not blocking the traffic.
6. Make sure that you install the outdoor unit in area easy to drain condensed water from the indoor unit.
7. Make sure that you install the outdoor unit in area which provides easy connection within the maximum allowable length of a coolant pipe(15 meters).

   Note
   1. Add 10 grams of refrigerant (R-22) for every 1 meter if the pipe length exceeds the standard pipe length of 5 meters.
   2. Maintain a height between the indoor and outdoor units of less than 3 meters.
8. Make sure that you install the outdoor unit in an area which is large enough to accommodate the measurements shown in figure on the next page.

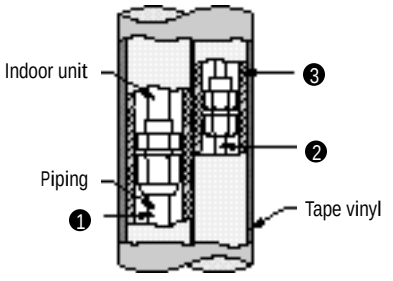
3-3-1(c) Remote Control Unit

1. Make sure that you install the remote control unit in an area free from obstacles such as curtains etc, which may block signals from the remote control unit.
2. Make sure that you install the remote control unit in an area not exposed to direct sunlight, and where there is no source of heat.
3. Make sure that you install the remote control unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).

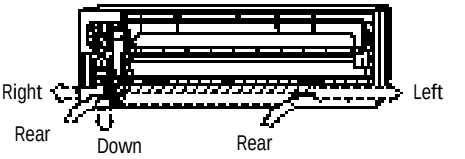
Caution :
It is harmful to the air conditioner if it is used in the following environments: greasy areas (including areas near machines), salty areas such as coast areas, areas where sulfuric gas is present such as hot spring areas. Contact your dealer for advice.

3-2-2 Installation diagram of indoor unit and outdoor unit

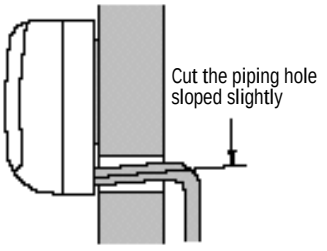
A Indoor unit gas leak test check point

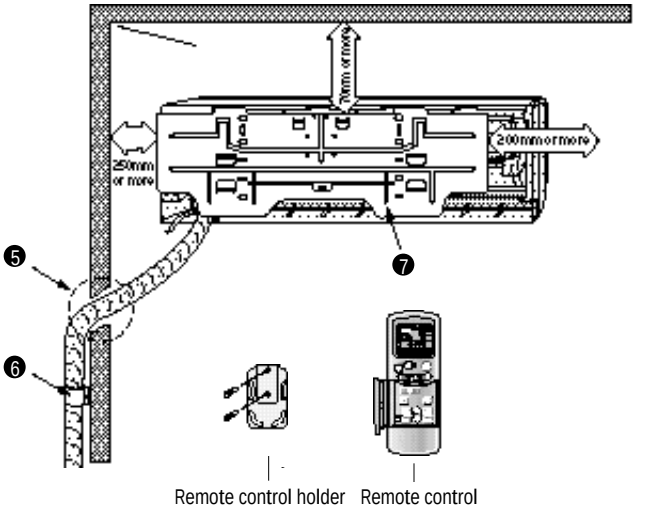


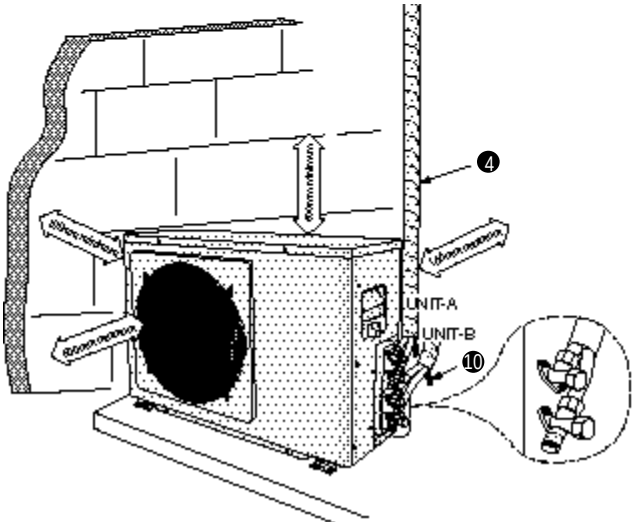
Piping may be laid to the rear, left, right or down .

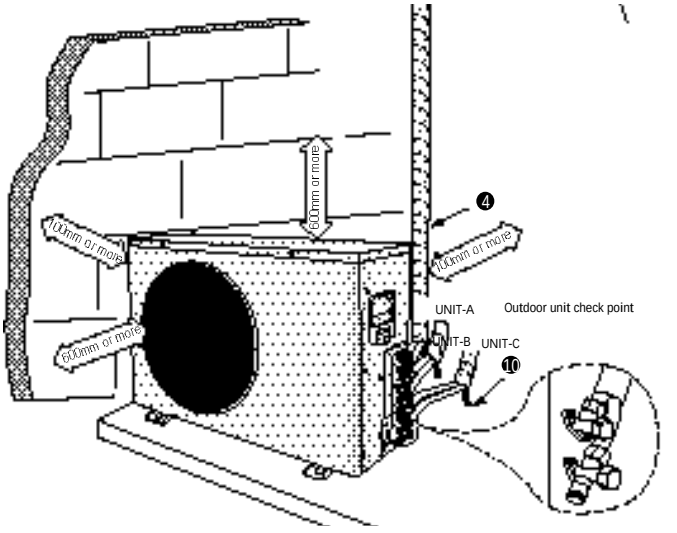


B Drain hose installation



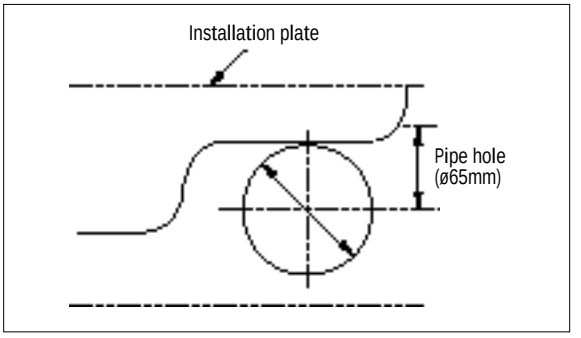






❶	Piping (Liquid) 1/4”	❻	Clamper tube
❷	Piping (Gas) 3/8”	❼	Installation plate
❸	Installation tube	❽	Pipe-connection
❹	Vinyl tape	❾	Screw
❺	Putty	❿	Drain hose

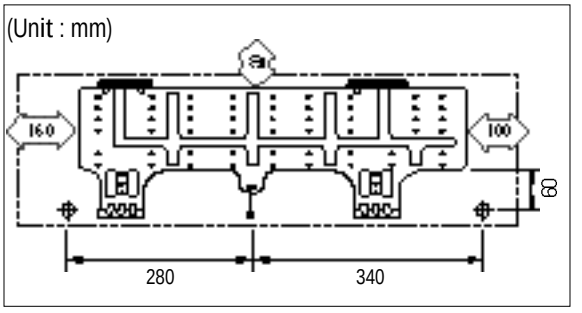
3-3-2(a) Fixing the Installation Plate



1. Determine the position of the pipe and drain hose hole using the right figure and drill the hole with an inner diameter of 65mm so that it slants slightly downwards.

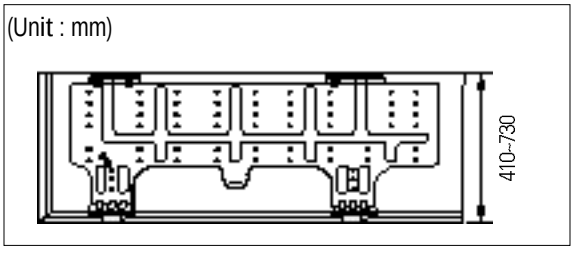
2.

If you are fixing the indoor unit to a…	Then follow Steps…
Wall	**3.**
Window frame	**4 to 6.**



3. Fix the installation plate to the wall in a manner appropriate to the weight of the indoor unit.

   If you are mounting the plate on a concrete wall with anchor bolts, the anchor bolts must not project by more than 20mm.

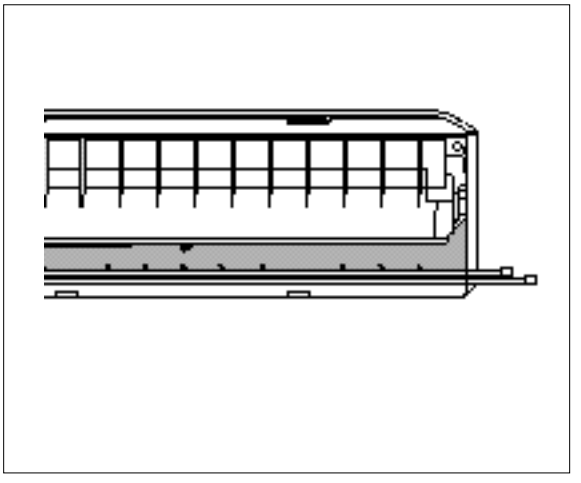


4. Determine the positions of the wooden uprights to be attached to the window frame.

5. Attach the wooden uprights to the window frame in a manner appropriate to the weight of the indoor unit.

6. Using tapped screws, attach the installation plate to the wooden uprights, as illustrated in the last figure opposite.

3-3-2(b) Purging the Unit



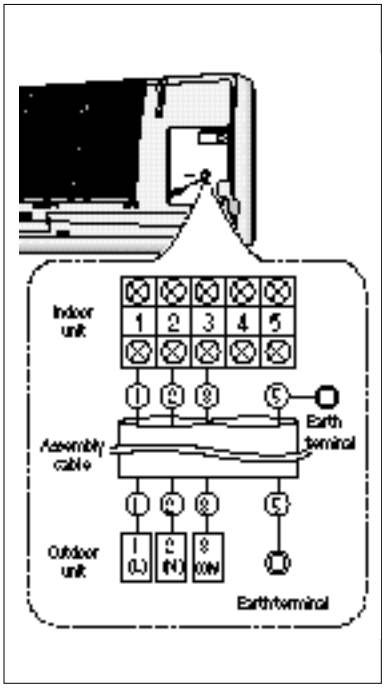
On delivery, the indoor unit is loaded with an inert gas. All this gas must therefore be purged before connecting the assembly piping. To purge the inert gas, proceed as fol - lows.

Unscrew the caps at the end of each pipe.

Result : All inert gas escapes from the indoor unit.

- **To prevent dirt or foreign objects from getting into the pipes during installation, do NOT remove the caps completely until you are ready to connect the piping.**

3-3-2(c) Connecting the Assembly Cable.

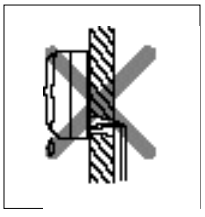


The outdoor unit is powered from the indoor unit via the assembly cable. If the outdoor unit is more than five metres away from the indoor unit, the cable must first be extended to a maximum of ten metres.

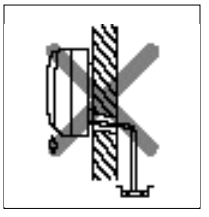
1. Extend the assembly cable if necessary.
2. Open the front grille by pulling on the tabs on the lower right and left sides of the indoor unit.
3. Remove the screw securing the connector cover.
4. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals 1 to 5.
   - Each wire is labelled with the corresponding terminal number.
5. Pass the other end of the cable through the 65mm hole in the wall.
6. Replace the connector cover, carefully tightening the screw.
7. Close the front grille.
8. For further details on how to plug the other end of the assembly cable into the outdoor unit, refer to page 3-10.

3-3-2(d) Installing and Connecting the Indoor Unit Drain Hose

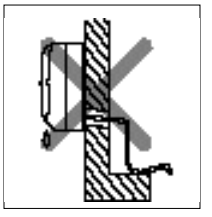
Care must be taken when installing the drain hose for the indoor unit to ensure that any condensa - tion water is correctly drained outside.l When passing the drain hose through the 65mm hole drilled in the wall, check that none of the following situations occur.



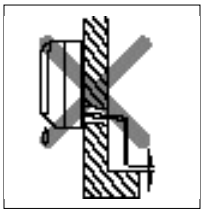
The hose must NOT slope upw ards.



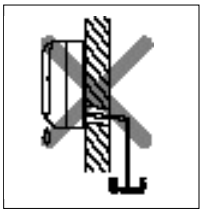
The end of the drain hose must NOT be placed in water.



Do NOT bend the hose in different directions.



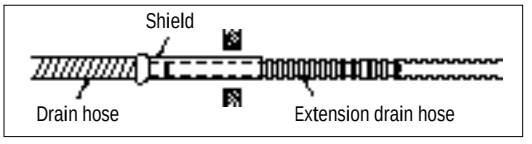
Keep a clearance of at least 5cm between the end of the hose and the ground.



Do NOT place the end of the drain hose in a hollow.

To install the drain hose, proceed as follows.

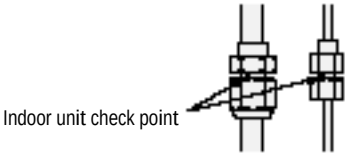
1. If necessary, connect the 2-metre extension to the drain hose.
2. If you are using the extension, insulate the inside part of the extension drain hose with a shield.
3. Pass the drain hose under the refrigerant piping, taking care to keep the drain hose tight.
4. Pass the drain hose through the hole in the wall, making sure that it is sloping downwards, as shown in the illustrations above.

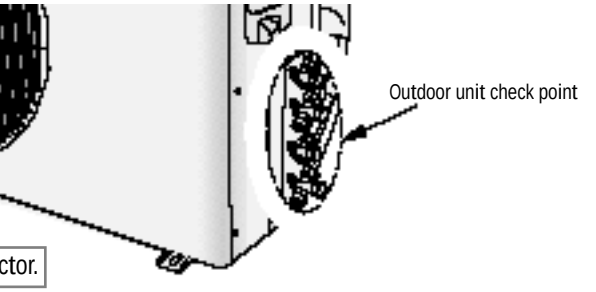


The hose will be fixed permanently into position once the whole installation has been tested for gas leaks; refer to page 16 for further details.

3-3-2(e) Outdoor unit installation

GAS LEAK TEST





Check for gas leak from the flare nut connections with leak detector.

WIRING CONNECTION

Two electric cables must be connected to the outdoor unit:

- **The assembly cable connecting the indoor unit to the outdoor unit.**
- **The power cable connecting the auxiliary circuit breaker to the outdoor unit.**

1 Remove the terminal board cover on the side of the outdoor unit.

2 Connect the assembly cable to terminals 1 to 5 and connect the power cable to therminals A to B.

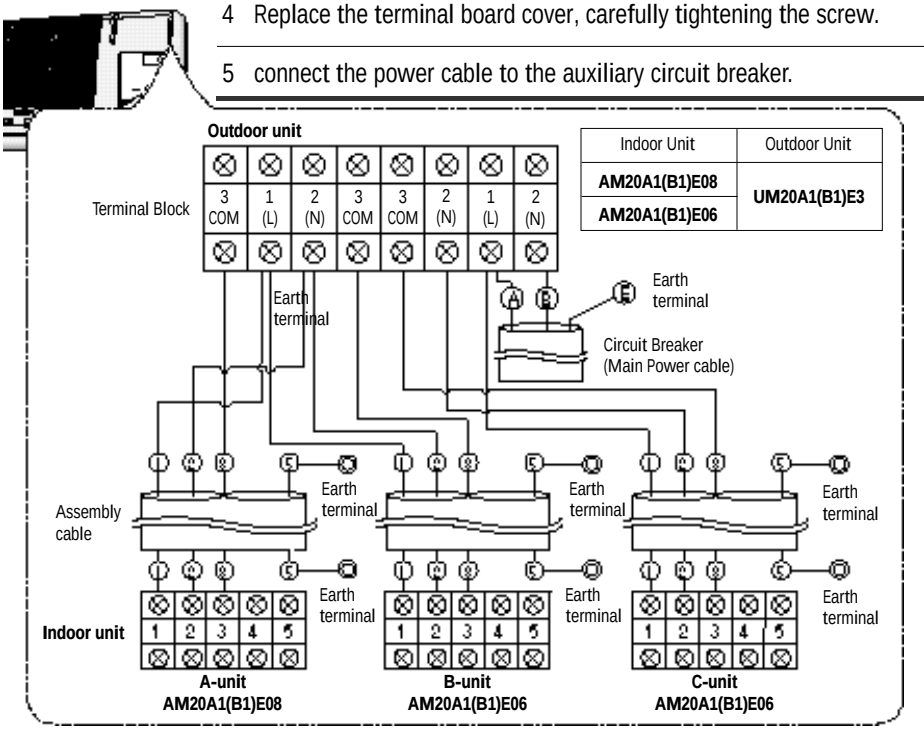
► Each wire is labelled with the corresponding terminal number.
► Ensure that the wire number of the indoor unit and the terminal number of the outdoor unit.

3 Connect the earthing wires to the earth terminals.

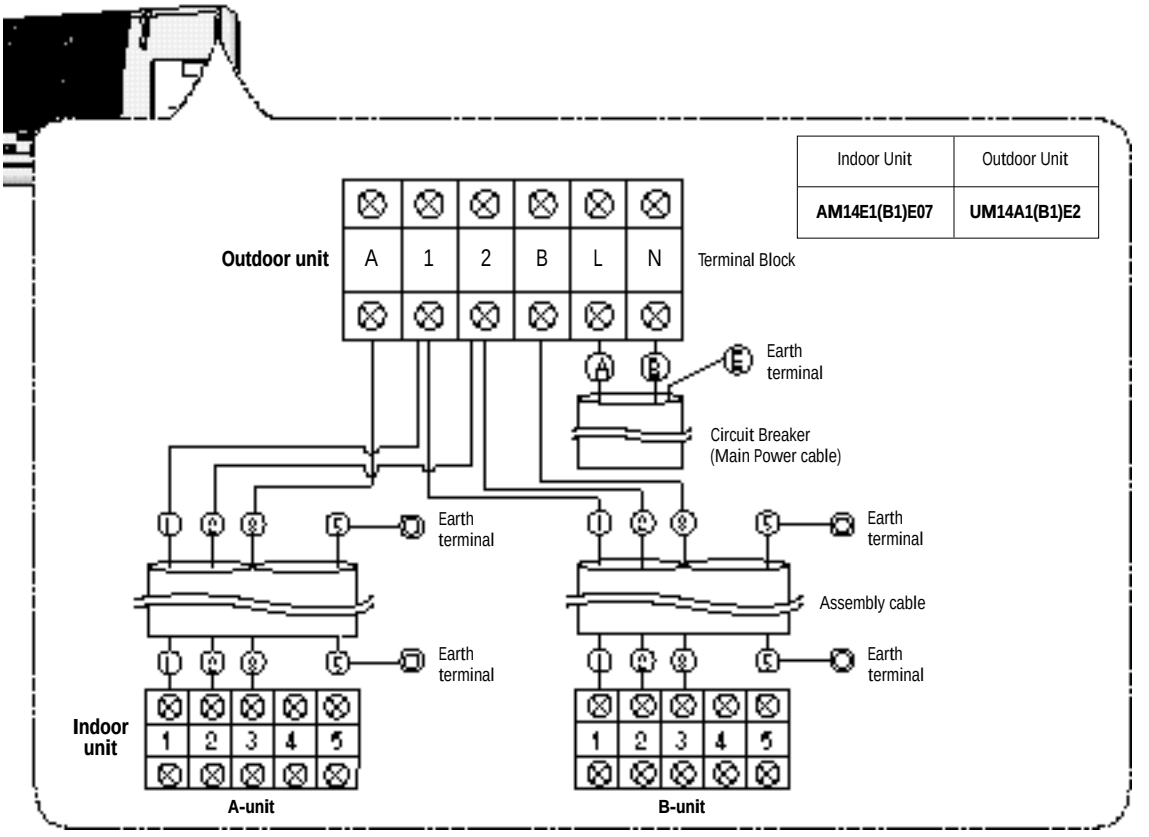
► Refer to the page opposite for further details on how to check that earthing is correct.

4 Replace the terminal board cover, carefully tightening the screw.

5 connect the power cable to the auxiliary circuit breaker.



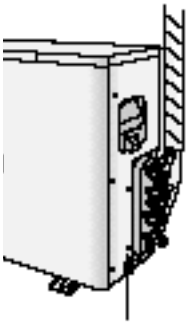
Indoor Unit	Outdoor Unit
AM20A1(B1)E08	UM20A1(B1)E3
AM20A1(B1)E06	



Grounding

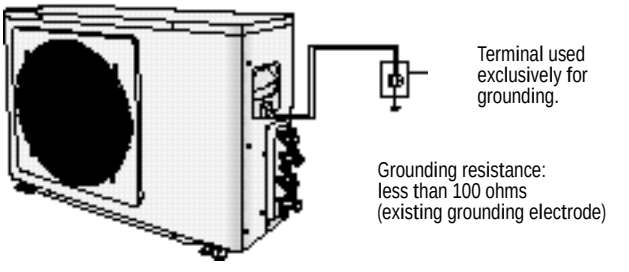
(The parts for this work are optional.)

- A grounding terminal can be found on the outdoor unit as illustrated.

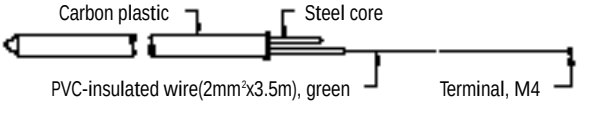


Grounding screw hole

1. When an existing grounding terminal is available. (Grounding wire of ®™1.6mm or larger<solid wire>or 2mm2 or larger <standard wire>)

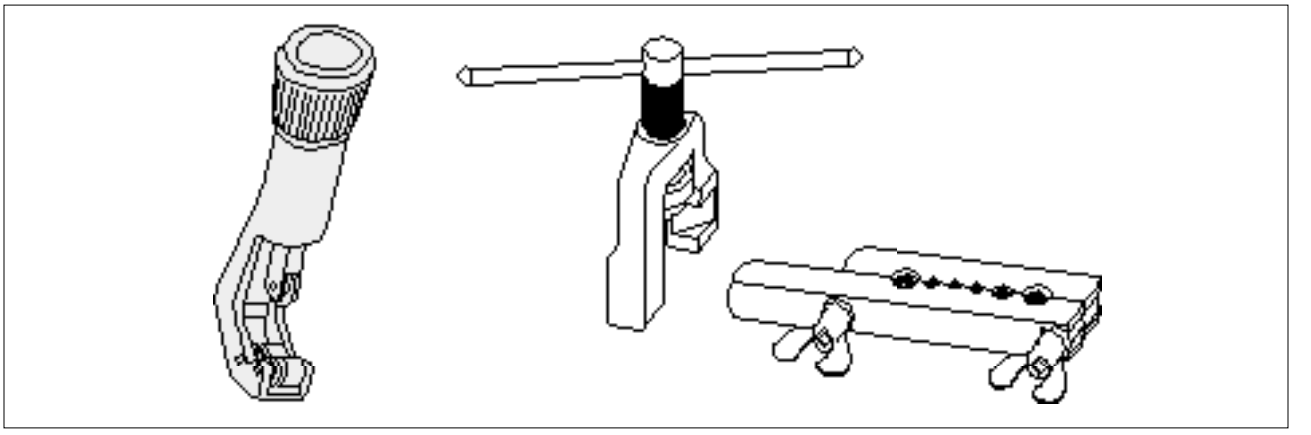


2. Use of a grounding electrode.
   - Specifications of grounding electrode.



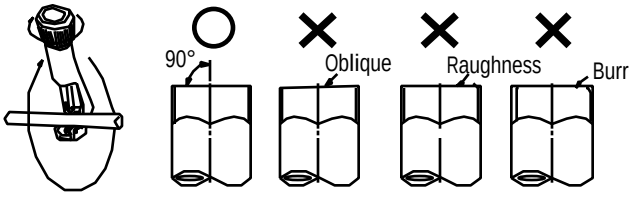
3-3-2(f) Flare Modification

• Tools used



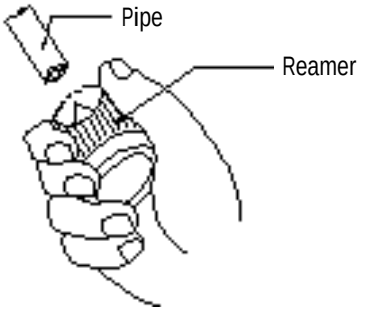
Flare modification procedure

1) Cut the pipe using a pipe cutter.

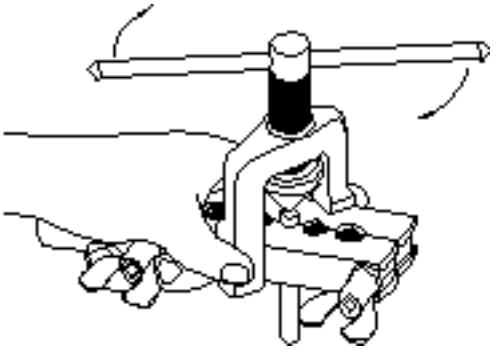


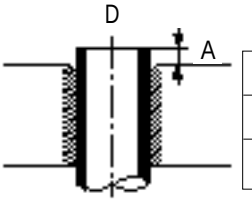
2) Remove burrs at the tip of the pipe cut.

Caution : Burrs not removed may result in leakage of gas.



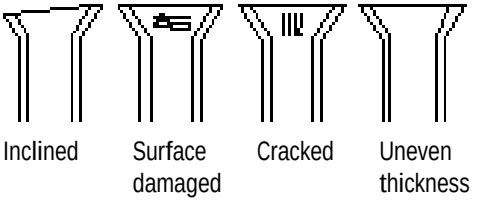
3) Insert a flare nut into the pipe and modifty flare.





Outer diameter	A(mm)
ø6.35mm	1.3
ø9.52mm	1.8

* Unproper flaring



3-2-2(g) Air-Purging

CAUTION

The air in indoor unit and in the pipe must be purged. If air remains in the refrigeration pipes, it will affect the compressor, reduce to cooling capacity, and could lead to a malfuction. Refrigerant for air purging is not charged in the outdoor unit. Use vacuum pump as shown at the right figure. Each unit must be purged in turn

1. Check the piping connections

↓

2. Connect the charging hose of low pressure side of Manifold gauge to the packed valve having a service port (3/8" or 1/2" Packed valve) as shown at the right

↓

3. Open the valve of the low pressure side of Manifold gauge counterclockwise.

↓

4. Purge the air from the system using vacuum pump for about 10 minutes.
   - Close the valve of the low pressure side of manifold gauge clockwise.
   - Make sure that pressure gauge show -0.1MPa(-76cmHg) after about 10minutes.
     This procedure is very important in order to avoid gas leak.
   - Turn off the vacuum pump
   - Remove the hose of the low pressure side of manifold gauge.

↓

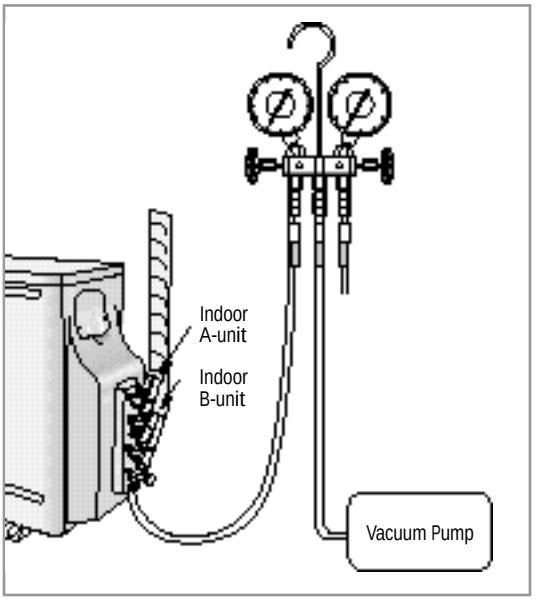
5. Set valve cork of both liquid side and gas side of packed valve to the open position.

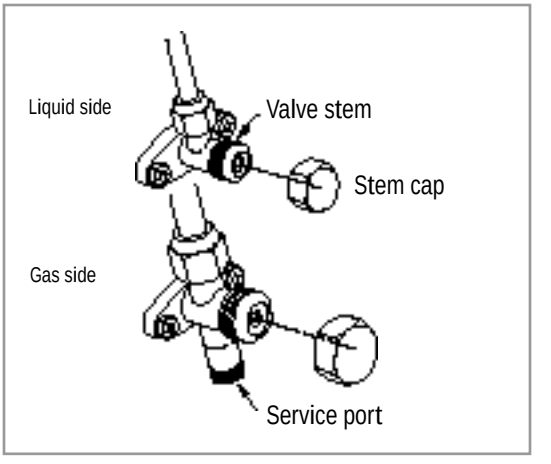
↓

6. Mount the valve stem nuts and the service port cap to the valve, and tighten them at the torque of 18N·m with a torque wrench.

↓

7. Check for gas leakage.
   - At this time, especially check for gas leakage from the 3-way valve's stem nuts, and from the service port cap.





3-2-2(h) Refrigerant Refill

If connecting pipe of more than 10 metres is installed, additional refrigerant should be charged by extra metre. You don't have to charge additional refrigerant up to 10 metres of connecting pipe.

1. Remove the valve stem cap and service port of 3-way valve.
2. Connect the charging hose of low pressure side of Manifold gauge to the packed valve having a charging port(1/2" Packed valve) as shown at the right figure.
3. Operate the unit at the cooling mode.
4. Slowly open the valve of the low pressure side of Manifold gauge counterclockwise until the low pressure of manifold gauge indicates 4.8 to 5.5 kg/cm2 (68 a 78psi) at the high cool operation (1-unit operation) and the standard temperature.

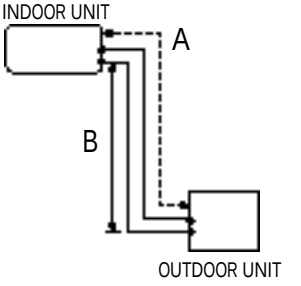
   It is recommend that refrigerant should be slowly put in. If the refrigerant is put in too quickly, compressor will be damaged.
5. Stop operation of the air conditioner.
6. Disconnect the charge hose of manifold gauge.
7. Close the cap of each valve.

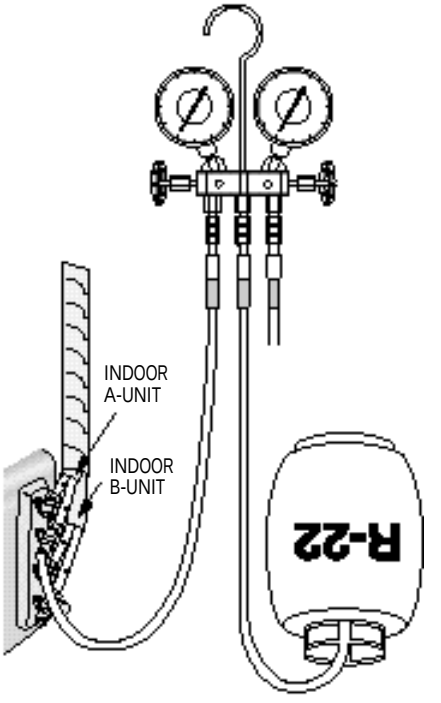
- Piping length and the height

	Pipe Size		Max.piping length A	Max height B
	LIQUID	GAS		
AM14A1(B1)E07 AM20A1(B1)E08 AM20A1(B1)E06	1/4"	3/8"	15m	3m

Additional refrigerant charge (R22,g)

- When length of the pipe is over 5u by the unit, you should charge the refrigerant Formulas
  A-UNIT : 10gx(La-10)/m
  B-UNIT : 10gx(Lb-10)/m
  (La:the length of A-unit's pipe Lb:the length of B-unit's pipe)





3-2-2(i) Flare unt fixing torque

Outter diameter	Torque (kg-cm)	
	Fixing Torque	Final Torque
ø6.35(Liquid Side)	160	200
ø9.52(Gas Side)	300	350

3-2-2(j) Pump down

1. Confirm that both the 2-way and 3-way valves are set to the open position.
   (1) Remove the valve stem caps.
   (2) Be sure to use a hexagonal wrench to operate the Gas side valve stems.

2. Operate the unit for 10 to 15 minutes.

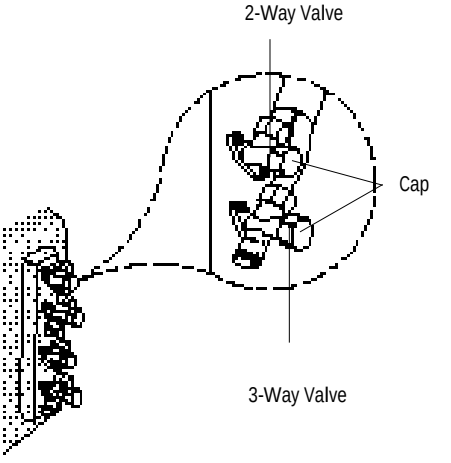
3. Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
   (1) Connect the charge hose with the push pin to the service port.

4. Air purging of the charge hose.
   (1) Open the low-pressure valve on the charge set slightly to air purge from the charge hose.

5. Set the liquid side 2-way valve to the closed position.

6. Operate the air conditioner at the cooling cycle and stop operation immediately after setting the 3-way valve to the closed position when the gauge indicates 0 kg/cm^{2}G.
   If the unit can not be operated at the Cooling Mode(weather is rather cool), operate the unit at the Trubo Mode. So that the unit can be operated.

7. Disconnect the charge set, and mount the both 3-way valve's stem nuts and the service port cap.



Relocation of the air conditioner

- Refer to this procedure when the unit is relocated.

1. Carry out the pump down procedure (refer to the details of 'pump down').
2. Remove the power cord.
3. Disconnect the assembly cable from the indoor and outdoor units.
4. Remove the flare nut connecting the indoor unit and the pipe.
   At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
5. Disconnect the pipe connected to the outdoor unit.
   At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
6. Make sure you do not bend the connection pipes in the middle and store together with the cables.
7. Move the indoor and outdoor units to a new location.
8. Remove the mounting plate for the indoor unit and move it to a new location.

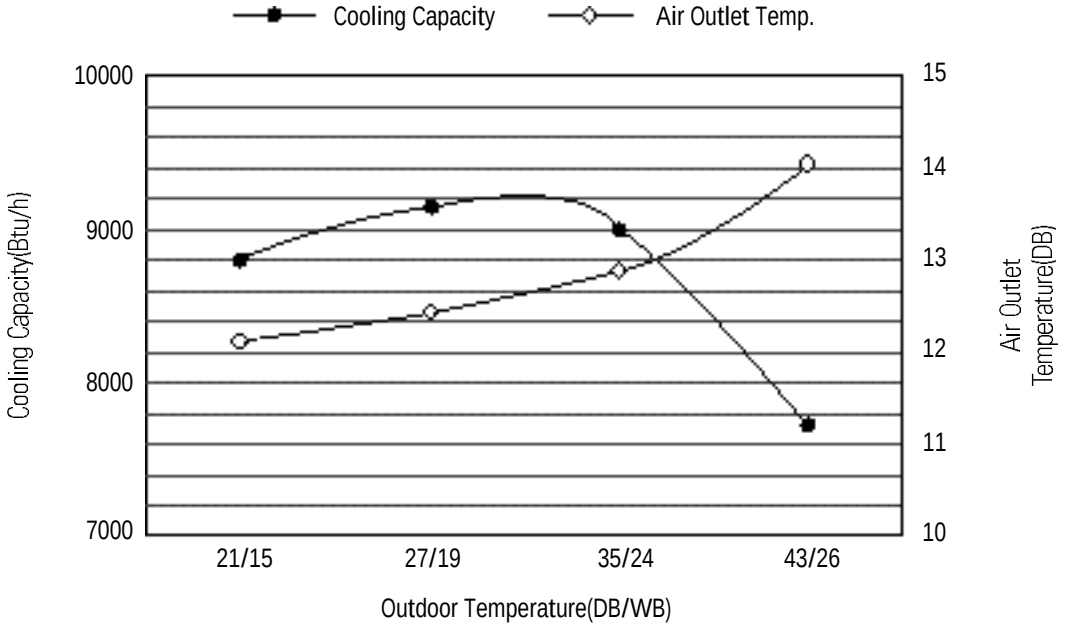
3-3-3 Technical Document

3-3-3(a) AM14A1(B1)E07 / AM20A1(B1)E08

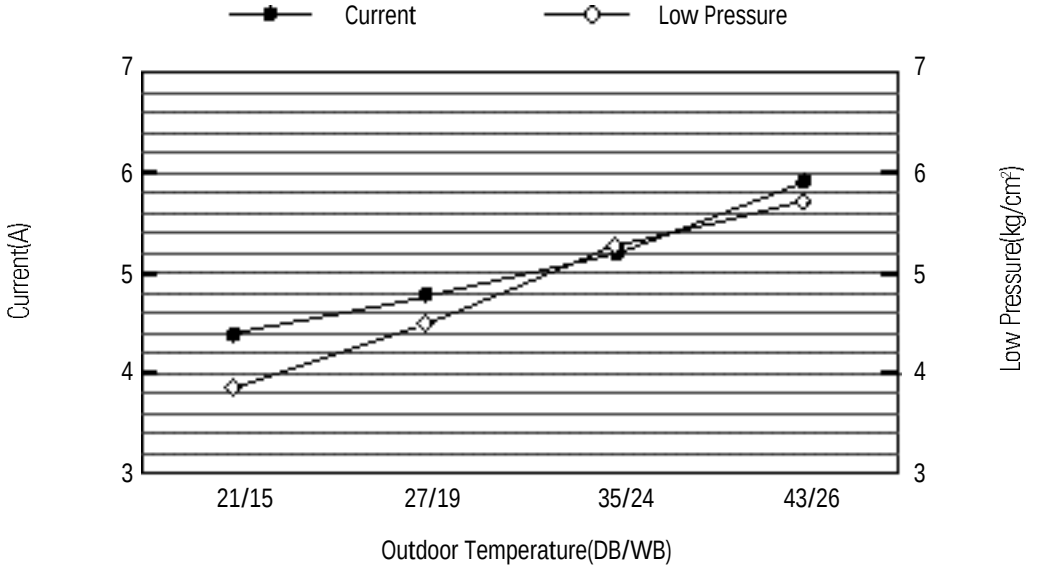
- Cooling Characteristics - Outdoor Temperature

  Test Condition Indoor Unit(DB / WB) : 27 / 19
  Voltage / Frequency : 240V / 50Hz

Cooling Capacity & Air Outlet Temperature



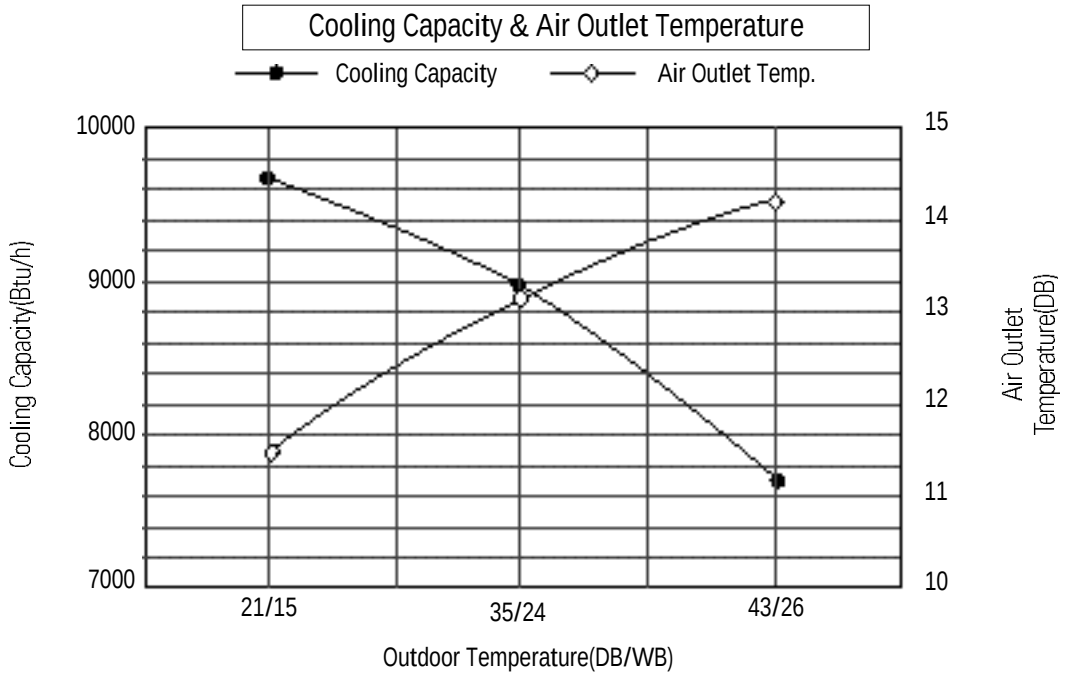
Current & Low Pressure

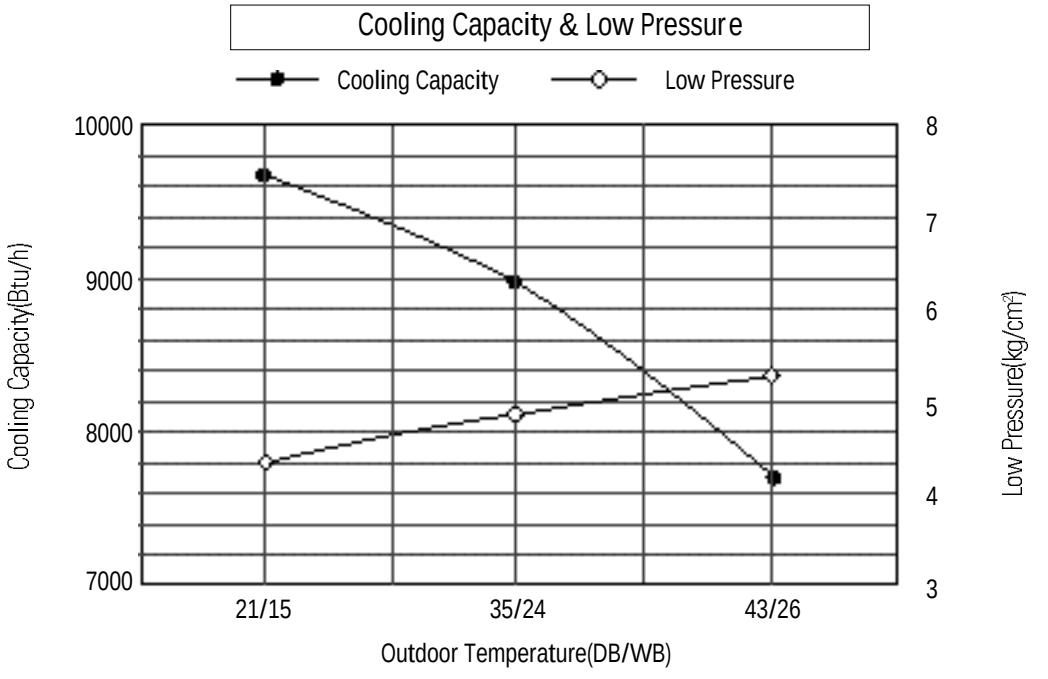


3-3-3(b) AM20A1(B1)E06

- Cooling Characteristics - Outdoor Temperature (B or C Indoor Unit Only)

  Test Condition Indoor Unit(DB / WB) : 27 / 19
  Voltage / Frequency : 240V / 50Hz





2. Product Specifications

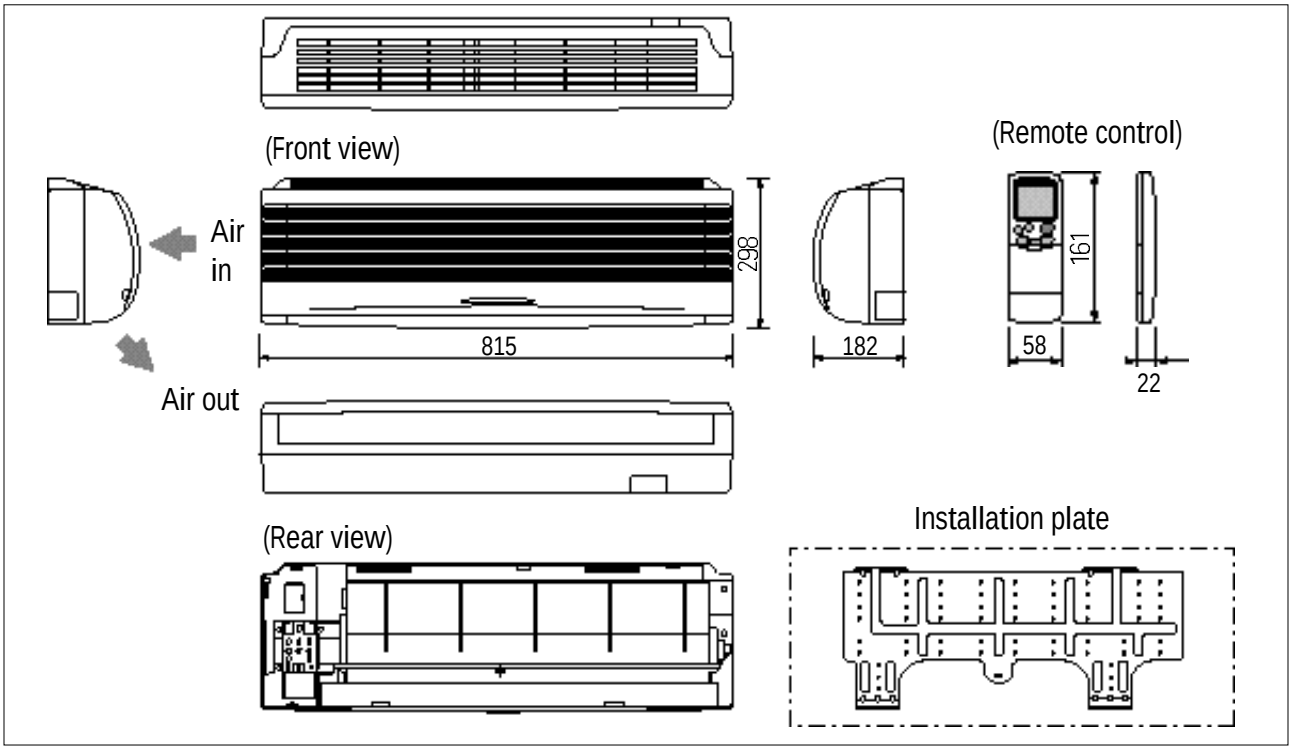
2-1 Table

Item \ Model					AM14A1(B1)E2		AM20A1(B1)E2		
					INDOOR UNIT	OUTDOOR UNIT	INDOOR UNIT		OUTDOOR UNIT
					AM14A1(B1)E07	UM14A1(B1)E2	AM20A1(B1)E08	AM20A1(B1)E06	UM20A1(B1)E3
Type					Wall-Mounting Multi Split				
Performance	Cooling	1 unit(A)		BTU/h	9,000		9,000		
		1 unit(B)			9,000		7,300		
		2 unit(A+B)			14,000 (7,000x2)		16,300 (9,000+7,300)		
		2 unit(B+C)			-		10,800 (5,400+5,400)		
		3 unit(A+B+C)			-		19,800(9,000+5,400+5,400)		
	Dehumidifying			I/h	1.2	-	1.6	1.1	-
	Air volume	Cooling		m^3/min	7.0	-	8.5	6.0	-
	Noise	Cooling		dB	35	55	38	35	54
	Power			V-Hz	1-220-240V~, 50Hz				
Power	Power Consumption	1 unit(A)		W	1,100		1,010		
		1 unit(B)			1,100		930		
		2 unit(A+B)			1,200		1,800		
		2 unit(B+C)			-		1,010		
		3 unit(A+B+C)			-		1,900		
	Operating Current	1 unit(A)		A	4.7		4.3		
		1 unit(B)			4.7		3.9		
		2 unit(A+B)			5.2		7.5		
		2 unit(B+C)			-		4.3		
		3 unit(A+B+C)			-		8.2		
	Starting current			A	30				
	Power cable(Option)				-	H05RNF25	-		H07RNF2.5
					H05RNF (4G 1mm^2)		H05RNF (4G 1mm^2)		
	Fuse capacity			A	3.15	-	3.15	3.15	-
Size	Outer dimension	WidthxHeight		mm	815x298x182	720x525x245	815x298x182	745x260x177	787x620x320
		xDepth		inch	32.08x11.73x7.17	28.35x20.67x9.65	32.08x11.73x7.17	29.33x10.23x6.96	30.98x24.41x12.6
	Weight			kg	9.6	35	9.6	8.0	54
	Refrigerant pipe	Liquid		OD(mm)xL(m)	6.35x5	-	6.35x5	6.35x5	-
		Gas			9.52x5	-	9.52x5	9.52x5	-
	Drain hose			ID(mm)xL(m)	17x2,000		17x2,000		
	Compressor	Type			-	Rotary	-		Rotary
		Model name			-	48A124JV1E5	44B092JW1E6	44B102JW1EG	-
		Capacitor				30μFx420VAC	30μFx370VAC	40μFx450VAC	-
		Motor	Type(model)		-	-	-	-	-
			Rated output	W	-	1210	895	950	-
	Blower	Type			Cross-fan	Propeller	Cross-fan	Cross-fan	Propeller
		Motor	Type		Resin	Still	Resin	Resin	Still
			Rated output	W	35	60	35	35	60
Heat exchanger					2Row 12Step	2Row 20Step	2Row 12Step	2Row 10Step	2Row 24Step
Refrigerant control unit					A+B-UNIT : Capillary Tube + Solenoid valve		A+B/C-UNIT : Capillary Tube + Solenoid valve		
Freezer oil capacity					-	410	360	350	-
Refrigerant to change(R-22)					-	1,000	700	860	630/860
Protection device					-	MRA12030-12008	MRA12037-12007	MRA12054-12008	-
Standard Conditions					ISO R5151 Standard		ISO R5151 Standard		

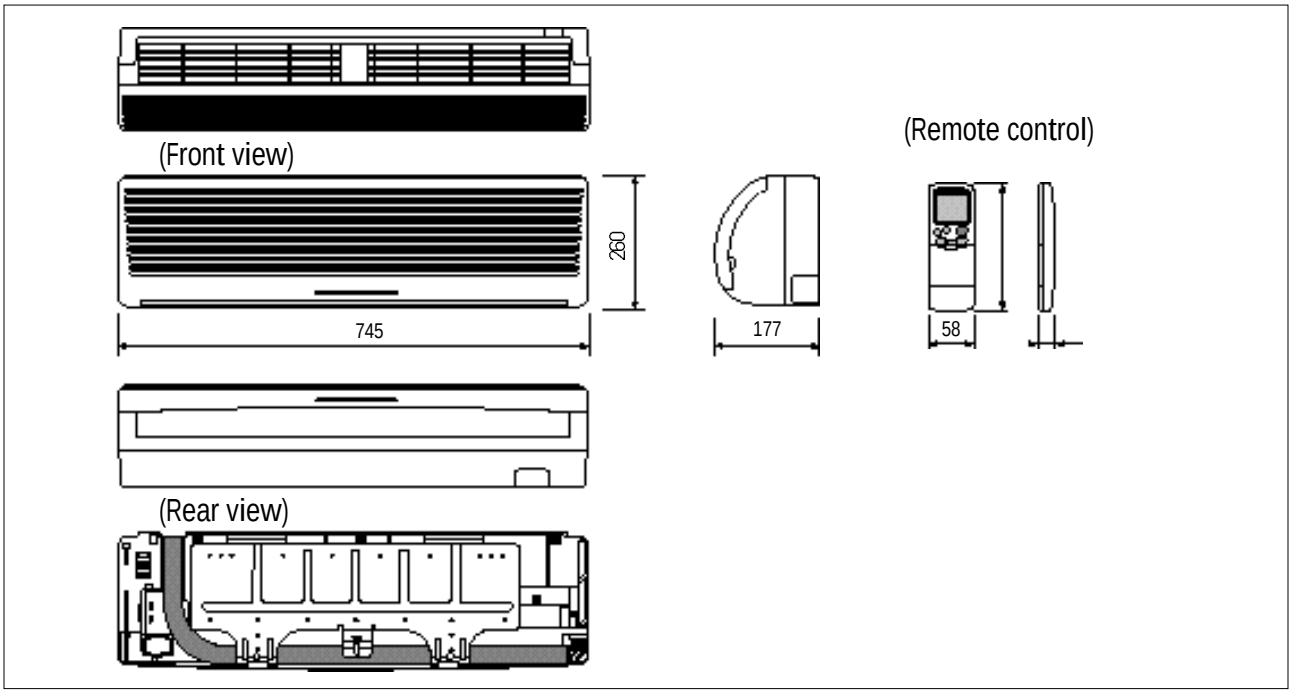
- The basic performance test is based on the piping of 5MT.(Be sure to check the installing conditions as extension of the piping may lead to performance degradetion.)

2-2 Dimensions

2-2-1(a) Indoor Unit (AM14A1(B1)E07/AM20A1(B1)E08)

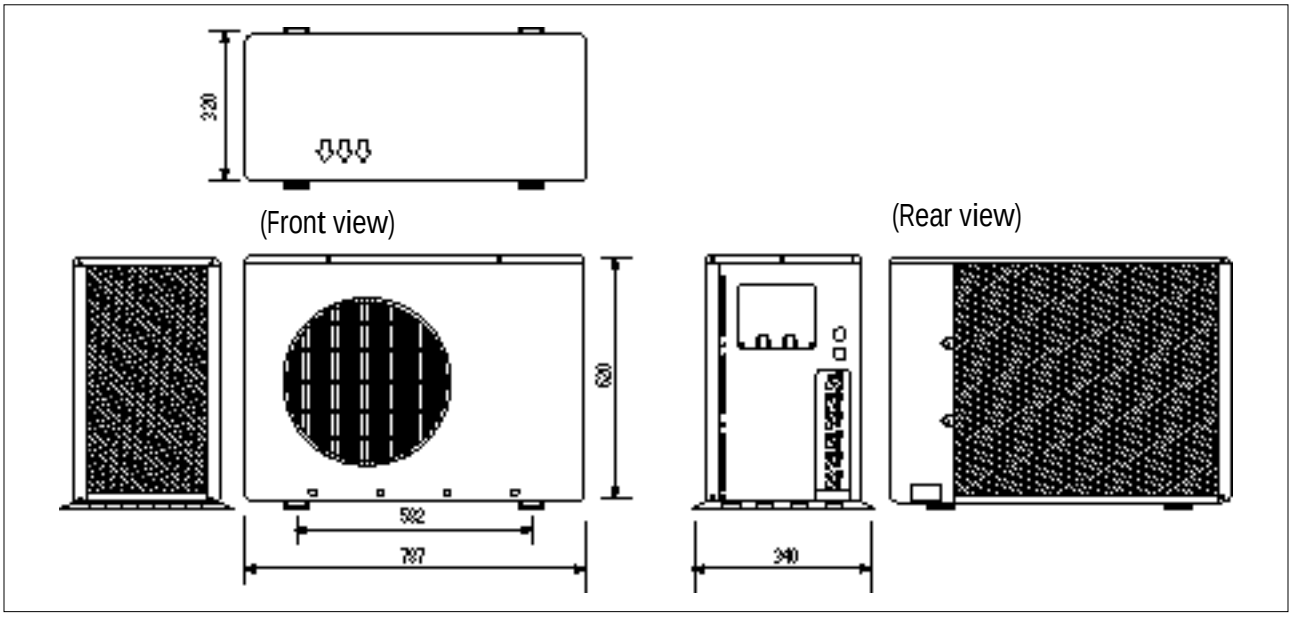


2-2-1(b) Indoor Unit (AM20A1(B1)E06)

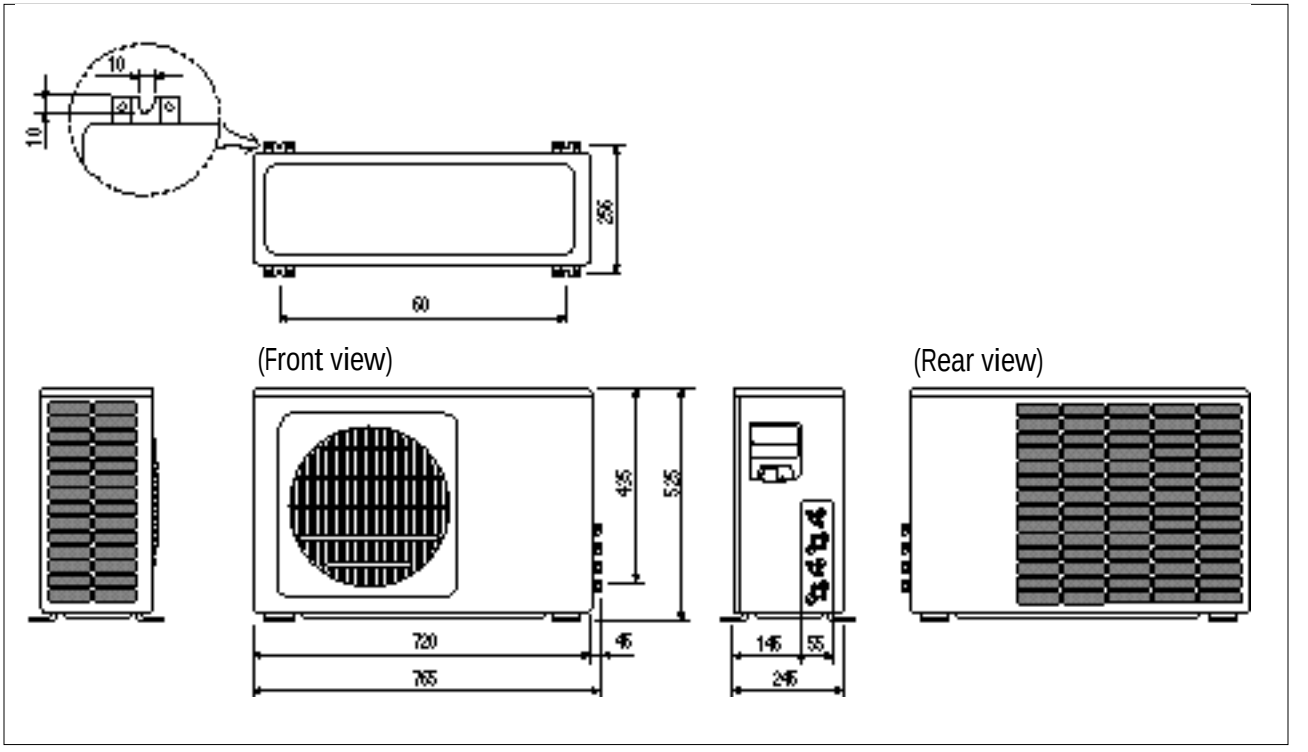


2-2-2 Outdoor Unit

2-2-2(a) UM20A1(B1)E3

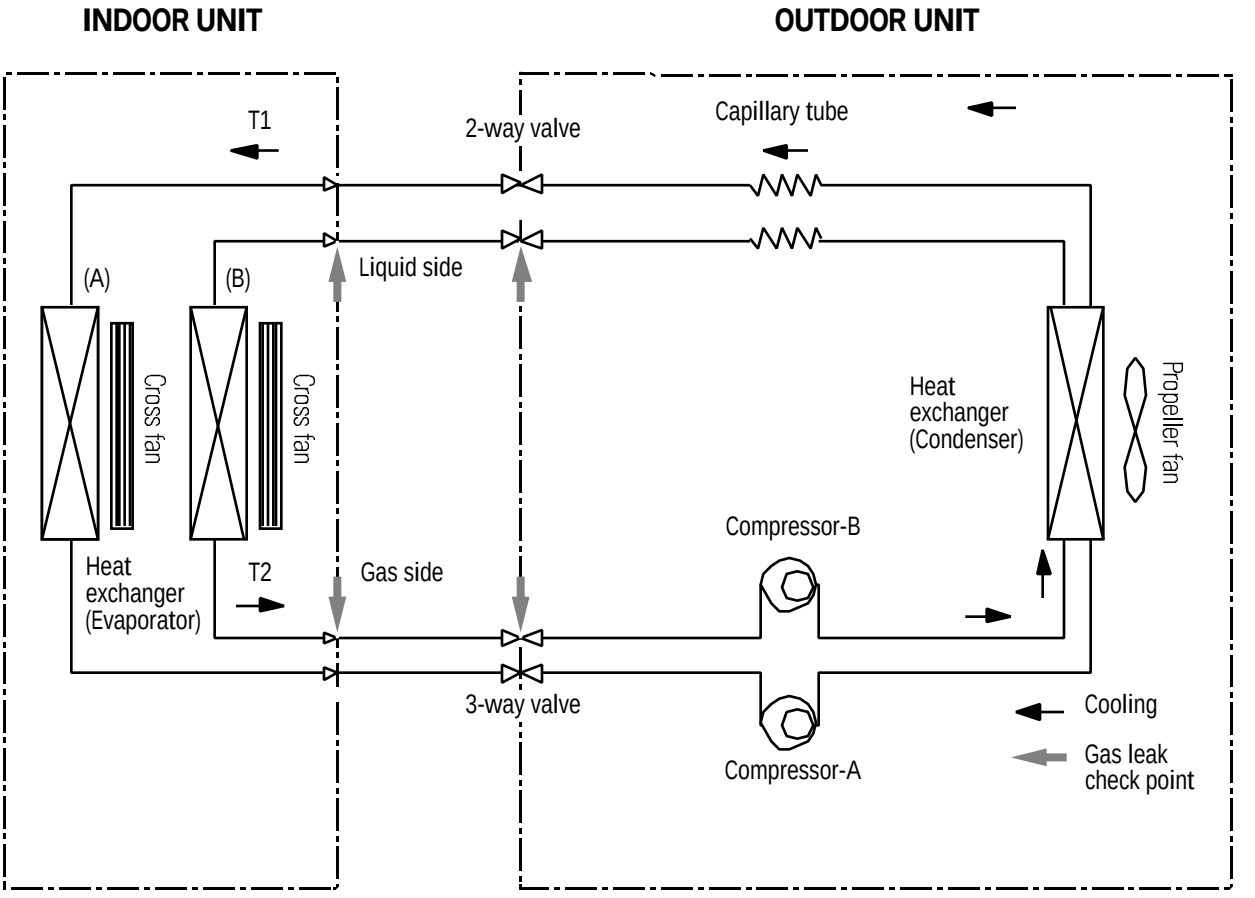


2-2-2(b) UM14A1(B1)E2



2-3 Refrigerating Cycle Block Diagram

2-3-1(a) UM14A1(B1)E2

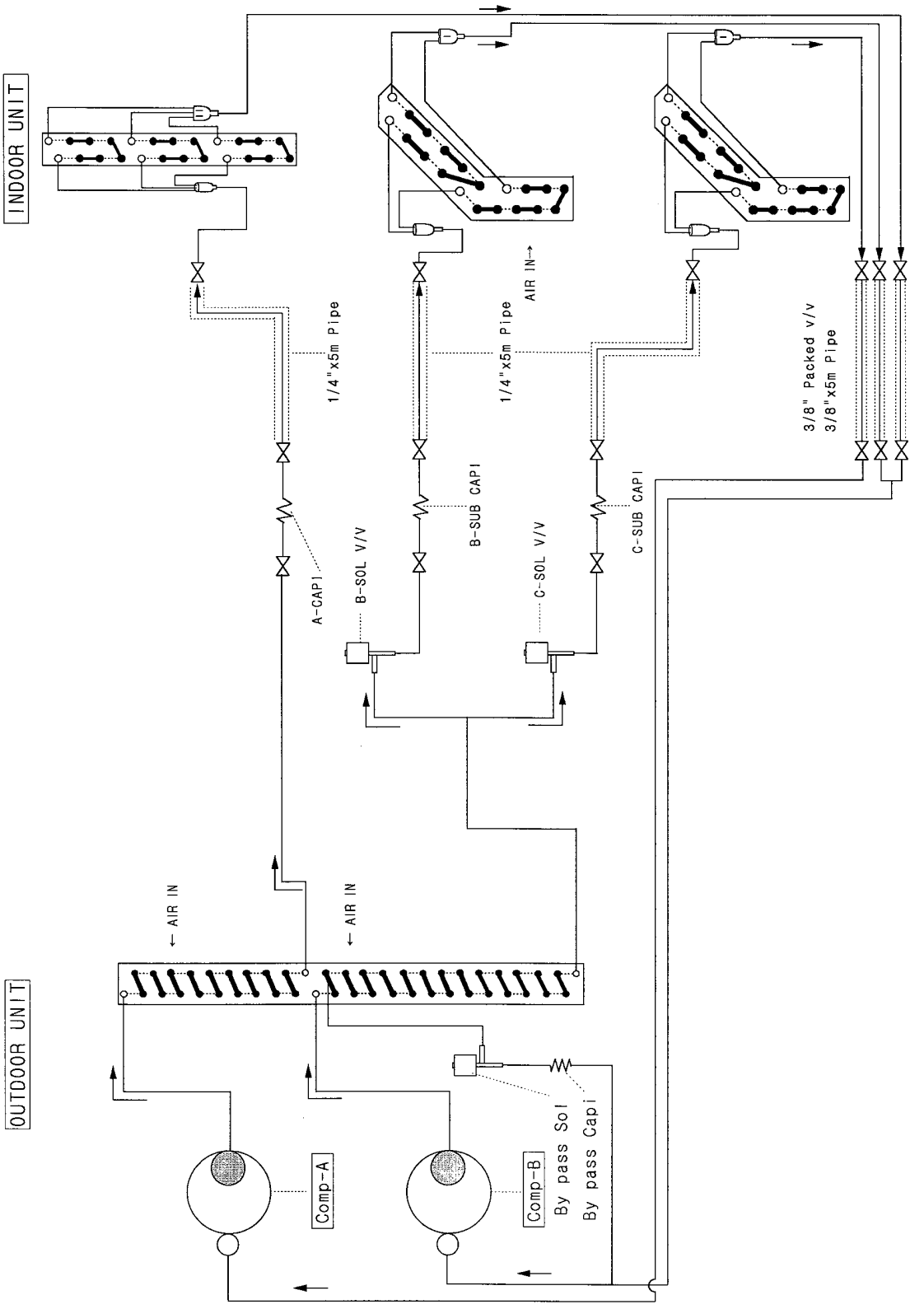


Refrigerating cycle temperature and pressure

Operating Condition			STD Pressure (kg/cm^2G) 3-way valve	Piping Temp.(°C)		Temp. Condition (°C)			
				T1	T2	Indoor		Outdoor	
						DB	WB	DB	WB
Cooling	A or B	Standard	5.0~5.2	11	11	27	19	35	24
		Max over load	6.0~6.3	16	15	32	23	43	26
		Low temp.	3.4~3.6	3	2	21	15	21	15
	A + B	Standard	5.0~5.2	12	10	27	19	35	24
		Max over load	6.0~6.3	16	15	32	23	43	26
		Low temp.	3.4~3.6	3	2	21	15	21	15

(Pipe Length:5m)

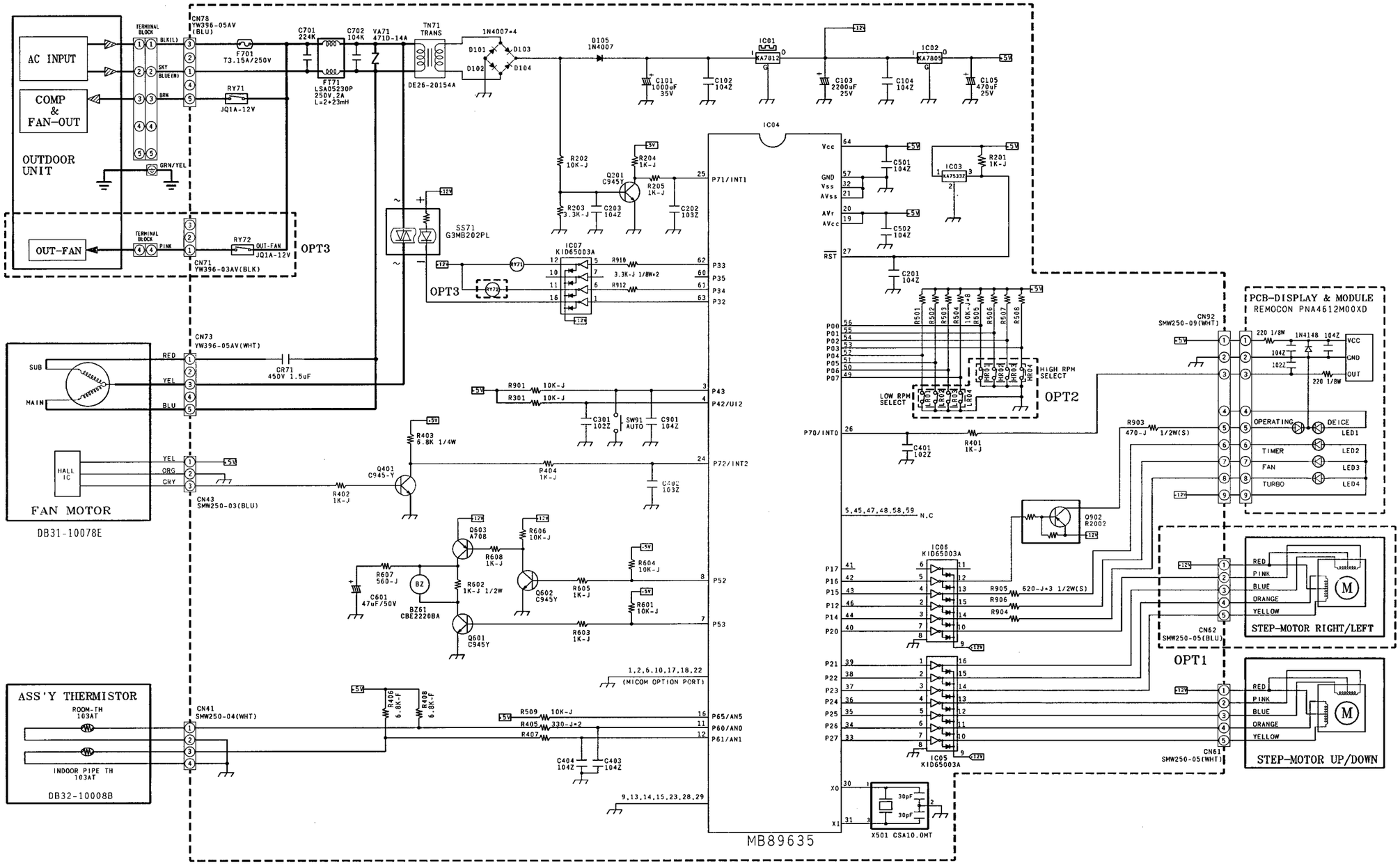
2-3-2(b) UM20A1(B1)E3



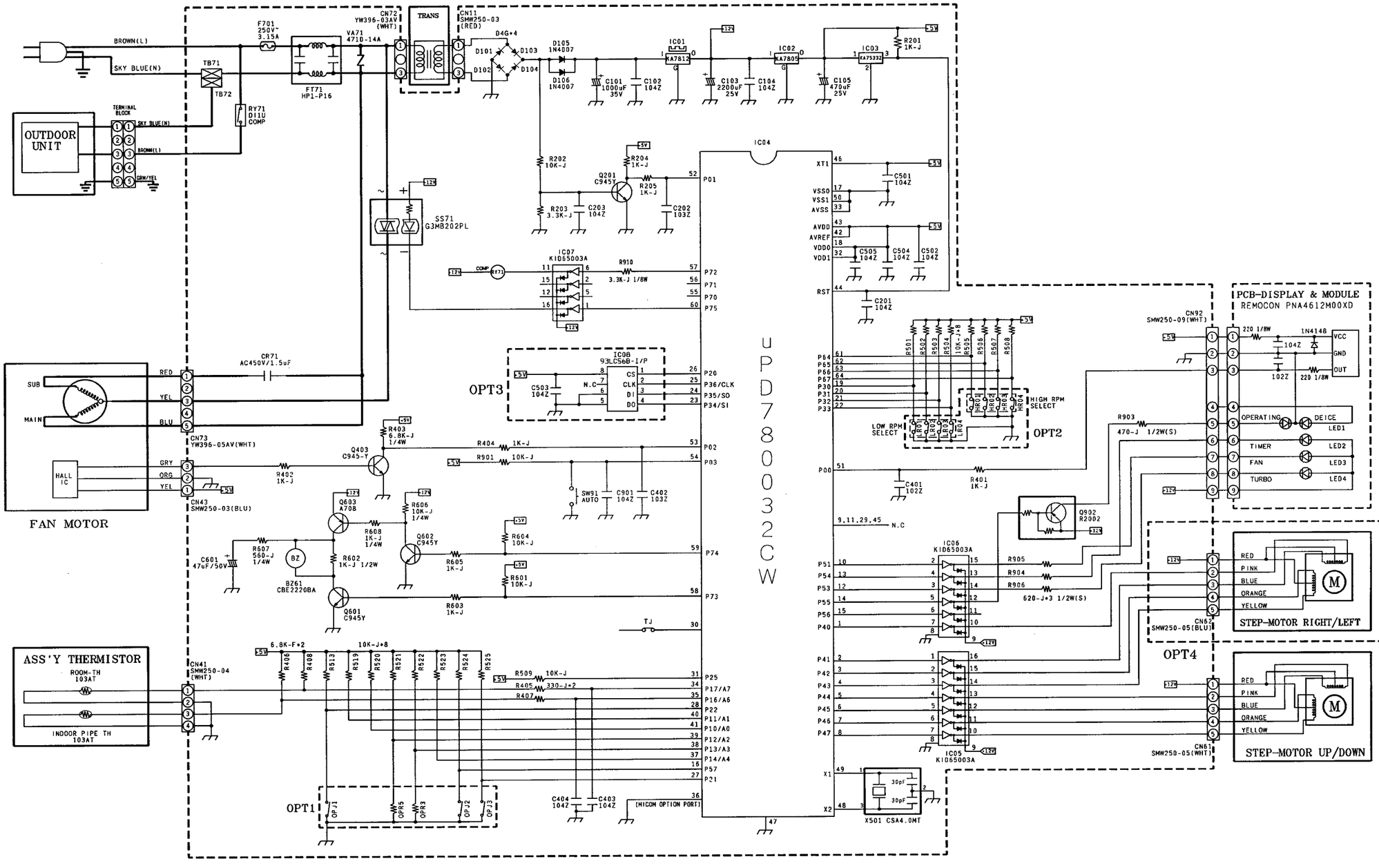
10. Schematic Diagrams

10-1 Indoor Unit

10-1-1 AM14A1(B1)E07



10-1-2 AM20A1(B1)E06



10-2-1 UM20A1(B1)E3, UM14A1(B1)E2